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The Supply Department

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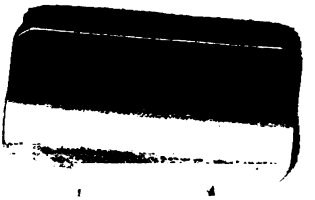

The Supply Department

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CHAPTER I.

Purpose and Organization.

The supply department, or what is commonly known as the stores department, of our railways, is an innovation of the last 10 years. Prior to that time, with the exception of the Middle West and the Northwest, the materials and supplies on our large railway systems were mostly specified, cared for and accounted for by the users. The railways had purchasing agents, but they were little more than clerks, under the direction of the general managers, and bought practically what was specified by the several departments. They were traders rather than systematic buyers. In all matters of moment they simply placed the orders as directed by the heads of the departments. The maintenance of the necessary stock, distribution and accounting, was done by the mechanical, or other department using the material. Little or no attention was paid either to what was bought, how it was maintained, or where it was used. In some instances the accounting department maintained a supervision over this work, but it was merely from an accounting viewpoint.

ORIGIN.

The growing roads in the Middle West and the Northwest recognized the necessity for a supply department, owing primarily to long dis-

tances from the market, the growing and varied character of their roads, but more particularly from a progressive and economical standpoint. This department was established and maintained on some of these roads as long ago as 25 years; notably the Chicago & North Western; the Chicago, Milwaukee & St. Paul; the Union Pacific; the Burlington, and the Great Northern. The last 10 years have brought great consolidation, new methods and economies, particularly as to the system of buying from manufacturers on specifications. This necessitated a more thorough and complete supply organization, and today, with one exception, there is not a system of any importance that has not a supply department, the business of which is to provide, distribute and account for all materials.

The importance and extent of this work can best be understood by the following figures:

Material and supplies used in the operation and maintenance of 29 principal railways, representing a little over 50% of the total mileage of the United States, as reported to the Interstate Commerce Commission as expended during the year ending June 30, 1908, was.....	$408,636,376
This is made up of approximately 40,000 items, and represents a permanent investment of.....	131,331,587

From this will be seen the necessity of a thorough organization under an officer equipped by experience and judgment, who should report to and be supported by the chief executive officer. That there should be no divided responsibility as between the buyer and the officer

who is responsible for maintaining and supplying what is required must be of first importance.

PURPOSE.

The real purpose of such a department is substantially as follows:

First: To provide material that is needed at the lowest cost and with the *lowest possible permanent investment.*

Second: As large consumers to take full advantage of the markets and freights, buying so far as possible direct from the manufacturers.

Third: Proper inspection and test to see that the railway gets what it pays for.

Fourth: To maintain standards by seeing to it that only materials covered by the specifications are ordered and supplied.

Fifth: To properly, promptly and economically care for, handle and account for all materials.

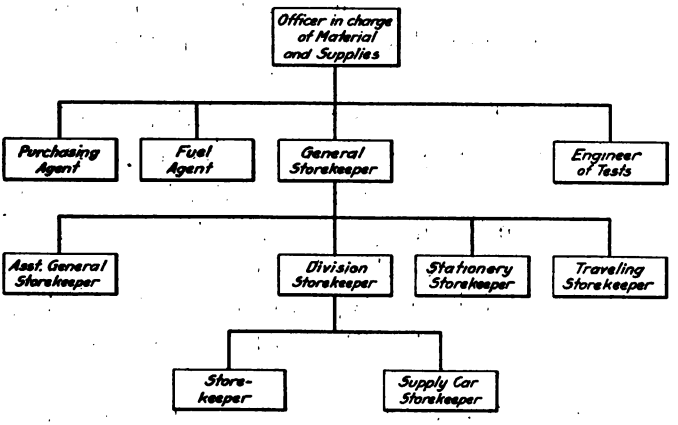
Sixth: Husband resources by keeping materials in as few places as possible, and in such shape that they may be ready to use or move whenever required.

GENERAL PLAN OF ORGANIZATION.

Organization and system are the foundation upon which depends the success of any undertaking, and in laying out any general plan it must be broad enough and flexible enough to meet all conditions, and always along practical lines. After a thorough, practical working organization is established, the rest is merely a matter of detail and the meeting of condi-

tions. The accompanying chart, which I here submit, will serve to graphically outline the organization. It can be increased or decreased to meet the size and conditions of the property.

The basis is a storekeeper, located at any point where sufficient unapplied material is maintained to occupy the entire time of one or more men to do the work. At points where there is not sufficient material maintained to



SUPPLY DEPARTMENT ORGANIZATION.

employ the time of one man handling and accounting, this work can be done by any other department maintaining an organization, but so far as the handling and accounting of the material is concerned, they are responsible for and report to the division storekeeper.

On each division, located at its division shops, there should be a division storekeeper, who should have charge of and be responsible for all unapplied materials on the division, reporting directly to a general storekeeper.

On each system or general manager's jurisdiction, there should be a general storekeeper, who should have charge of and be responsible for all unapplied materials under the general manager's jurisdiction. Reporting to him directly should be the division storekeepers, stationery storekeeper and traveling storekeeper, or inspector of stores. He, in turn, should report directly to the officer in charge of materials and supplies, who may have the title of either vice-president in charge of materials and supplies, general manager or supply agent, who in turn should have reporting directly to him the general storekeeper, purchasing agent, engineer of tests, and fuel agent, and who should in turn report to the chief executive officer.

CHAPTER II.

Duties of Officers.

THE OFFICER IN CHARGE OF MATERIAL AND SUPPLIES.

This is purely an executive office, and should be presided over by a thoroughly practical man, who has had detail experience in the buying, distribution, handling and accounting for railway materials, and thoroughly acquainted with the detailed organization. It is essential that he should know personally the conditions which surround each detail of operation of the department, and the atmosphere which prevails at all points, so that he may intelligently and promptly pass on all matters which are brought before him, and with a personal knowledge of the surrounding conditions. He must have a good general knowledge of the detailed workings and purpose of all other departments, should be absolutely honest and fair, and above all, must have the entire confidence and support of the chief executive officer; without this his very best efforts will fail.

It is not necessary to maintain a large bureau or office; all records and data must necessarily be prepared by sub-heads. The heads of the departments are in position to call for and obtain any information desired at any time. There is absolutely no excuse for the duplication of work. All contracts should be

handled by him, and all changes in standards be issued from his office. He should be a member of the committee on standardization, because upon him and his organization will depend, more than any other department, the maintaining of standards.

His knowledge of the necessity for promptness in handling requisitions, the placing of orders, tracing and the movement of material to the work, will enable him to force the sub-heads to work toward the end of cutting out every unnecessary move, reduce the permanent investment for material, and, at the same time, give better service.

He should be in constant touch with the other departments, work proposed, financial conditions, matters of policy, and, above all, should be in a position to encourage and direct the work of his sub-heads. He should be in constant touch with the detailed working of his organization, and not allow his office to become so exclusive that the sub-heads, such as the purchasing agent, general storekeeper, engineer of tests and others, may feel that they are not privileged to consult with him at all times. They should understand that they are not only privileged, but it is their duty to consult and advise with him constantly. This confidence must exist if the organization is to be useful. By eliminating the detail of bureau work from his office, he is in a position to give these matters the necessary personal time, as well as to give ample time to investigation and keep in touch with the various

departments, and the general policy of the owners.

THE PURCHASING AGENT.

It is not necessary that the purchasing agent should have a knowledge of the practical application of the material which he buys, in fact, with our large systems it is hardly possible. Many of our best purchasing officers have little or no knowledge of the material they buy. They are fully protected by the specifications, tests and store inspection. He should be a keen, wide-awake business man, absolutely honest and fair, a good seller as well as a good buyer. The selling is as important as the buying, and in many respects more so. He should maintain a thorough and complete office system and records. All requisitions for material should go to him. A system of bids and prices should be maintained; in fact, the unit of efficiency for his office is *prices* and *deliveries*. His organization must be so systematized as to handle the requisitions in the least possible time, which means that his data should be so arranged that it can be as promptly applied as the material on the shelves of the storehouses. Every day saved in the handling of requisitions saves complaints and delays, places the material that much closer to the user, and in the same proportion reduces the investment. Material covered by contract or agreement should be so tabulated and arranged that the orders can be placed in every case the day the requisitions are received. There is no excuse

for any delay in placing the requisitions for material covered by contracts or agreements, the order being merely a matter of form to check against prices and deliveries. Competition should be encouraged and competitive bids obtained and tabulated.

All scrap, surplus and obsolete material should be sold by him. This will be found a great economy to his company, and requires the exercise of excellent business judgment.

The full power of the purchasing officer should be concentrated on three things:

First: Buying material at the lowest possible price.

Second: Obtaining the quickest possible deliveries.

Third: Selling scrap, obsolete and surplus material to the best advantage.

THE GENERAL STOREKEEPER.

The general storekeeper should be the active executive of the organization, and must be a thorough organizer, disciplinarian, tireless worker, and have a thorough detailed knowledge of all matters pertaining to the providing, handling, distribution and accounting for materials, as well as a good knowledge of the operations of the various departments, particularly the mechanical and maintenance of way. It should be his duty, not only to provide and care for material, but to know that it is properly applied to the company's requirements. His office should be largely executive, dealing directly with the division storekeepers,

where the details of the work and records are kept. He must be in accord with the operating department at all times, and keep informed of the progress of its work. His time will be occupied in maintaining the organization, strengthening the weak places, inspection, providing facilities, anticipating demands, curtailing expenditures, cutting off unnecessary purchases, sorting over and making over second-hand and obsolete materials, arranging for sale of obsolete and unused materials and tools, and in every way maintaining an organization which will *provide for actual requirements*—one which will deliver material that is actually needed to the work in the least possible time. On him devolves, probably more than any other officer, the maintenance of standards. His unit of efficiency is *percentage of actual purchases to disbursements* and *permanent investment for material.*

THE FUEL AGENT.

The segregation of locomotive fuel from the other material under a fuel agent, on roads where the conditions and the volume of business may warrant, is for the purpose of more direct supervision. The fuel agent should have a good knowledge of the location and kind of fuel available. He should strive to establish competition among the different producers. He should arrange to provide the quality of coal which is most economical and suitable for the particular class of equipment and service operating on each division or

district. He should so arrange the delivery of fuel as to keep up the necessary supply with the least possible amount of stock fuel on hand, and keep in mind the need of the service.

Fuel inspectors should report to him.

THE ENGINEER OF TESTS.

It is important that the engineer of tests should report to the officer in charge of material and supplies in order that delays may be prevented. His position is to make sure that the company gets exactly what the specifications call for. His organization should be so arranged that material can be inspected promptly so that deliveries will not be delayed. He should investigate and test materials offered for sale whenever so desired by the general supply officer. He should, in conjunction with the mechanical engineer, assist in the preparation of the specifications for material. In this alone, his detail knowledge of the service and the use of materials will make him of great value. The greatest care should be observed in preparing the specifications to see that they are made along practical and economical lines, taking into consideration, of course—first, the service desired; second, the markets and prices, and prepare them in such a way that they will neither be extravagant nor restrict their manufacture.

THE DIVISION STOREKEEPER.

The division storekeeper is to the division what the general storekeeper is to the system, and in addition must maintain the working

organization and records. He should have full charge of all unapplied material on the division and all requisitions originating on the division should be sent to him so that they may be filled so far as possible from material on the division. They should then be sent to the general storekeeper when necessary for completion, the latter filling the requisitions from unapplied material from any part of the system, and if the necessary material is not in stock, ordering the same purchased.

Necessarily the division storekeeper should be located at the principal shops of the division, in order to avail himself of the company's facilities for repairing and making over material. He must have accurate and first knowledge of all work going on, as well as contemplated, and keep in active touch, not only with the division officers, but with the men actually doing the work. He should have charge of the supply cars operating over his division, sorting of scrap, the application of surplus and obsolete material, and the accounting on his division under the direction of the auditor. He should maintain a general stock of material for the division at his headquarters, moving it from the general store in carloads, and distributing it over his division in supply cars, or by other means whenever it may be necessary to meet emergencies.

THE STATIONERY STOREKEEPER.

The stationery storekeeper should be a man that has a practical knowledge of forms used,

different weights of paper and methods of padding; in other respects his organization should be identical with that of the division storekeeper, except that it should handle only stationery, and for the entire system.

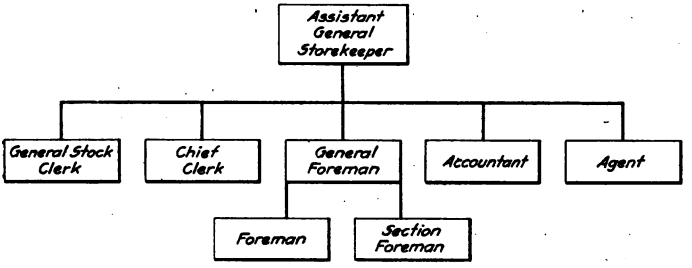
THE TRAVELING STOREKEEPER OR INSPECTOR OF STORES.

The traveling storekeeper should be the lieutenant of the general storekeeper, and must be primarily an accountant, for the reason that he will constantly be called upon to take charge of division stores, owing to sickness, absence, or changes, and must be so equipped that he can operate the division from the office. He must be able to go into an office at any and all times and check it up, to see that the work is being handled properly and in accordance with established methods. He should, of course, also have a good practical knowledge of the material and its uses, and be able to direct its proper handling and application. However, as most division stores have practical men of this character in their organizations, it is not only absolutely essential that the traveling storekeeper should be able to operate the store or the division in a general way. It is important he should have a thorough knowledge of the organization as a whole in order to attain his full value as a representative of the general storekeeper on the ground.

CHAPTER III.

General Stores.

The plan of organization for the general store is shown by the diagram. The general store is the jobbing house of the railway, and should be located at the general manufacturing plant, as conveniently located as possible to the foundries, rolling mills, and forge shops, and always conveniently located for switching and

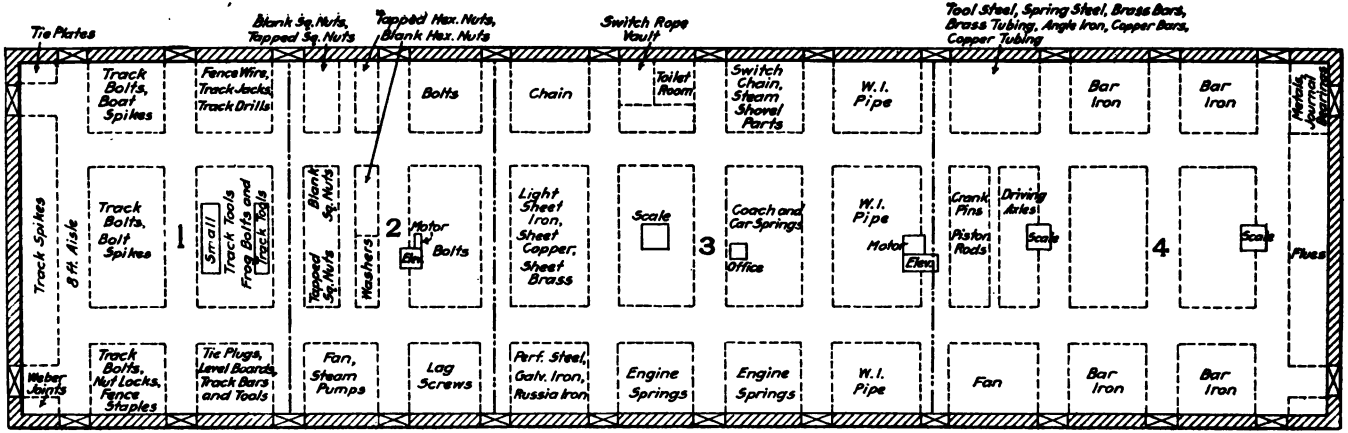


GENERAL STORE ORGANIZATION.

trackage. Where possible the general store should be located at the gateway to the system. Of course this can only be done when the general manufacturing shops are located in the same manner, as it is more desirable to have the general store at the principal manufacturing shops than at the gateway, the purpose always being to have the general store as near the market as possible. The manufacturing shops being the best market the railway company has, the general store must necessarily be connected with it.

On most large systems, owing to the geographical location of its lines, markets, etc., it is necessary to have two or more general distributing stores, but the fewer the better. The ideal arrangement would be to have only one, for the reason that it means not only elimination of duplication in the organization, but also a great reduction in the investment of material. Generally speaking, it is necessary for the general material yards, that is to say, where lumber, piling, track material, etc., are assembled, to have a separate location, as it is more desirable to have this class of material located a shorter distance from where it is needed in order to save back haul, and more particularly to have it where it is most available for the entire system. The location is selected generally for the purpose of making it accessible to all points on the system in case of emergency, and will be treated in detail later. Were it possible to have the main shops, the general storehouse and general material yard all together at the gateway of the system, it would be the ideal arrangement.

The organization and facilities of the general store must be adequate to meet the maximum requirements. A fallacy of many railway officers is that large store buildings mean large stocks. The opposite is true. Ample room to have a place for everything and everything in its place is the only way a store can be operated economically, and with the minimum stock. It is absolutely essential and of first importance, and must be understood by all store-



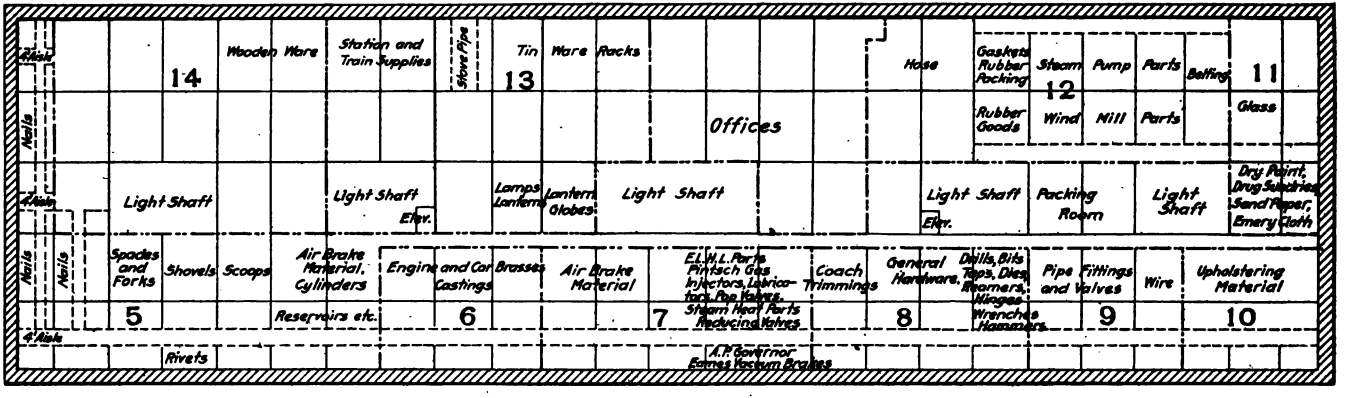
FIRST FLOOR PLAN; GENERAL STOREHOUSE.

keepers, that material must be segregated, each kind and size separated, even though it may be necessary to clear off ground and pile it up outside.

While facilities are important and necessary to the economical care and handling of material, still they are of less importance than the organization. Therefore the first thing we must consider is an organization which is adequate to promptly and fully meet all requirements. The general store being the jobbing house of the system, it is really the transfer point, and it is therefore necessary that every detail should be planned along the line of economical and prompt handling.

The real purpose served by the general store is promptness in delivery, and the system must be such as to enable it to ship its goods as quickly as any first-class commercial jobbing house. Therefore its organization is of vital importance. In addition, it also serves the local division where it may be located and the company's principal shops. In this respect it is a division store as well as a general store.

In laying out this plan the writer had in view the prompt filling of requisitions and economical operations. For this purpose it was laid off into sections, as shown. That is, the material was grouped with a view of convenience in handling and economy in operation, and with the further view of having a man in charge of each class of material who should be an expert in this particular class, and who actually handles it, both in and out. For this



SECOND FLOOR PLAN; GENERAL STOREHOUSE.

reason roadway material is put into one section, as it is necessary to have a practical track man in charge of this section. Section 2 contains bolts, nuts, lag screws and washers. This is a heavy stock that requires plenty of space and hard work, but it does not require a skilled or high-priced man to handle it. Section 7 contains air brakes, lubricators, injectors, steam heat equipment, headlight parts, etc. It is necessary to have a man who is an expert in this class of material; and, throughout, material of this same general class is grouped in one section with this purpose in view.

The sections are divided so that they can be handled by one man, and only in a few cases is it necessary for a section foreman or storekeeper to have a helper, the idea being that it is better to divide them into additional sections as the volume of business increases rather than establish a department. In this way we have one man who actually handles all the material in and out of a section, and who is actually responsible for the same.

Each section is operated as a separate store, and the foreman keeps his own stock books. He is furnished with a copy of every order for the purchase of material for his section, keeps his own "freight received" record, unpacks and checks the material into the proper section or shelves, and in every way conducts it as an independent store. Each section has its stock listed in books, arranged alphabetically. These books show the compartment in which

the material is located, technical description of the material, average monthly consumption, amount on hand and amount ordered each month. The stock is taken for requisitioning purposes each month and entered into the proper column. The section storekeeper then enters directly over the item on hand, the amount of unfilled requisitions, then enters after each item the quantity which he estimates will be required to cover a certain period (the basis of his calculation is 30 days) plus the time it takes for delivery and such special conditions as may arise, which is noted in the stock book. The stock books are then turned over to the assistant general storekeeper, who, in company with the requisition clerk, goes over each individual item, entering after such item in the stock book the requisition number that covers it, making such changes and corrections as his knowledge of conditions will warrant. The requisition is then made on the purchasing agent for what needs to be purchased, and transfer requisitions for such material as may be transferred from other points.

The entire organization is based on every person in it having a certain specific responsibility. For this reason the organization is in charge of the assistant general storekeeper, who is really the general storekeeper on the ground, but instead of his jurisdiction extending over the entire system his duties are confined to the operation of the general store. This leaves the general storekeeper free to

operate over the system, giving each store its full share of attention and consideration.

Reporting directly to the assistant general storekeeper are chief clerk in charge of correspondence and such, general stock clerk in charge of general stock books and requisitions, accountant in charge of accounts, general foreman in charge of all outside work, section foremen in charge of each individual section, or separate store; agent in charge of receiving and billing of company material; supply car storekeeper in charge of delivery of material to the division or district served. In this way every unit is working simultaneously, instead of around a circle under a different organization.

Requisitions are made out by sections in accordance with the classification. On all stock items a stock limit is placed, which indicates to the section storekeeper that when he has reached this limit he must place requisition to replenish his stock and what he requires hurried on his requisitions. This is approved by the general stock clerk after he has personally investigated each case to see that it is necessary, and that nothing can be substituted from the storehouses or along the line. Requisition is then made on the purchasing agent.

Each sub or division store is furnished with a general classification, also an indexed classification, showing in which section each class or each item of material is located. The

requisitions are given a registered number, and the section to which they are sent noted after same. They go directly to the section to which they belong, where they are filled, package properly addressed, giving reference to the requisition number and section, and the bill attached to the box or package. They pass through the section storekeeper to the invoice or manifest clerk, who invoices or manifests them, after which they are filed in numerical order. The manifesting and invoicing of the day's business is all done at night. This enables the consignee always to get his invoice or manifest before he receives the material. The section number is placed on the package or box so that the material, when it arrives at its destination, can be taken directly to the section to which it belongs, thus, it is not necessary to open it until it is ready to put away.

Each section storekeeper is required to inspect all material received by him, and is responsible for obtaining what is most suitable for the purpose. He keeps in touch with the user of the material, and calls the storekeeper's attention to any items which are not standard and interchangeable or suitable for the purpose. He is also required to call attention to any material received which is too good for the purpose for which it is to be used. He also arranges for the inspection of material bought subject to the company's specifications at point of receipt.

The receiving foreman has charge of all

material received, also checking, unloading, and delivery to outside aisles of each section. The force is divided into crews under a checker or gang boss. The bills are obtained each morning from the agent, and the bills for each car distributed among the checkers. The checker has a clip file with tally sheets attached to the waybills. The material is all checked, either in the car or on the platform directly outside the car door, and the tallies checked against the waybills. The material is all marked for the section to which it belongs and delivered to the outside aisles of the respective sections. The waybills, together with the original tally sheets, are turned over to the agent, who makes the freight bills and attaches same so that the freight bill, waybills and tally sheets are all together. These tallies are then copied into the "freight received" books.

The shipping foreman has charge of all shipments. His force is divided into crews under checkers or gang bosses, who take the material from the inside aisles of each section, together with the bills, and deliver it into the proper cars. The shipping foreman has a schedule of shipping points grouped for the purpose of loading cars so far as possible directly to where the material is to be furnished. Each day he posts a loading list of the cars which are to be loaded and the territory which they cover. The shipping crew takes the material from the aisles of each section and puts it into cars in station order. The shipping bills are

then attached to the requisition and this is filed with the agent who does the billing.

SHOP DELIVERIES.

There should be a local telephone exchange for the shops and stores. The pits, machines and forges in the shops should all be numbered and with telephone booths established at different places in the shops. Each section in the storehouse should have a telephone, the number of which corresponds in number to the number of the section. In each of the booths in the shops should be posted the sectional arrangement of the storehouse, showing in which section the various materials are located. Material is all ordered by telephone directly from the section storekeeper, instructing what is wanted, where to be delivered and to what to be charged. All material is delivered by storehouse men and boys. Boys are employed for handling light material and men for the heavy. As soon as an order is received it is put up and a shop order made out, giving description, name of the foreman who ordered the material, number of pit and forge or machine to which it is to be delivered. The foreman's receipt is obtained on the shop order, which is returned and checked off on a blotter kept for this purpose by the section storekeeper. No shop men should be allowed in the storehouse.

The shop orders are numbered, priced and extended each day, and the charges abstracted to the proper accounts. This enables all con-

cerned to know exactly what charges have been made to certain work, and enables the storekeeper to know how much business he is doing every day in order to keep track of the cost of operation. All material made in the shops for stock is made on store orders; that is, the storekeeper makes an order on the various shops for what he requires, exactly the same as he would on an outside firm. All material drawn in connection with the work is charged to this order, as well as the labor. When the work is completed it is delivered to the shop delivery crew, which gives a receipt for the material, taking up the duplicate store order and stub, which gives the detail, of material and labor, and from which charges are made.

Shipments from the general store should be made in carloads, wherever possible, the division stores distributing to the work by supply cars, a method that will be described in another chapter.

It is the intention that requisitions should be filled as promptly as from any first-class department store. All requisitions for material which should be carried in stock should be filled within twenty-four hours from the time they are received. When the requisitions are received in the morning, they are delivered to the general stock clerk, who registers them and gives them a number as a means of identification. They are then checked against the surplus lists at outside division stores, and any items which can be filled from out-

side points are so indicated on the margin by the name of the store in pencil after the item, the purpose being to first make available material outside that is not needed, always aiming to keep the surplus concentrated at the general store. The requisitions are then arranged according to sections, and delivered by a messenger to the various section storekeepers, who indicate by a cross after each item whether it is on hand or provided for. They are then returned by the same messenger to the general stock clerk, who first draws off transfer requisitions for such material as can be furnished from outside points, purchase requisitions are made on the purchasing agent for such as must be bought, and the requisitions are then returned to the respective sections for filling, knowing that the material is provided for. Packing and shipment begin at once.

In this way action is obtained first on the material not on hand. For example, while one man is making a requisition on the purchasing agent for material which has to be bought, at the same time another man is making transfer requisitions on other stores for material which is located at other points on the road, and at the same time various section storekeepers in the storehouse are packing and putting up ready for shipment the material on hand, all to be finally assembled by the shipping foreman and forwarded in one car.

Cars are loaded on schedule, that is, they are grouped as to territories so that all material is

handled in car lots, practically no material being moved through local freight houses by way freights. Emergency shipments are moved in baggage cars by passenger trains. In this way extra car haulage is saved, but, above all, loss and delay incident to the movement of company material through local freight houses by local trains is avoided.

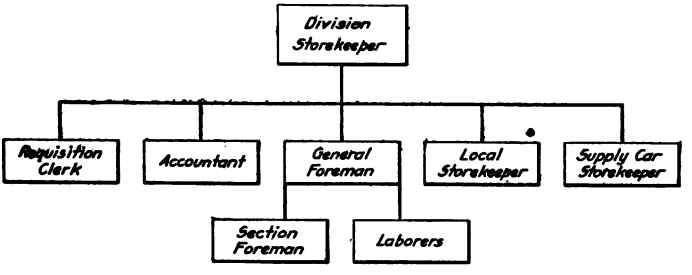
There is a floor foreman on each floor who has approximately the same duties as a floor walker in a department store. The lumber yards, scrap docks, oil houses and platforms are all operated in the same manner, each in charge of a section storekeeper or foreman, and each having its specified stock and duties to perform.

Details regarding the stock records, accounting and interior arrangement of stock will be found elsewhere.

CHAPTER IV.

Division Stores.

The plan of physical organization shown by this chart is practically the same as the general store, modified and consolidated to conform to the business. In making these consolidations it should be noted that they do not in any way destroy the general plan of the



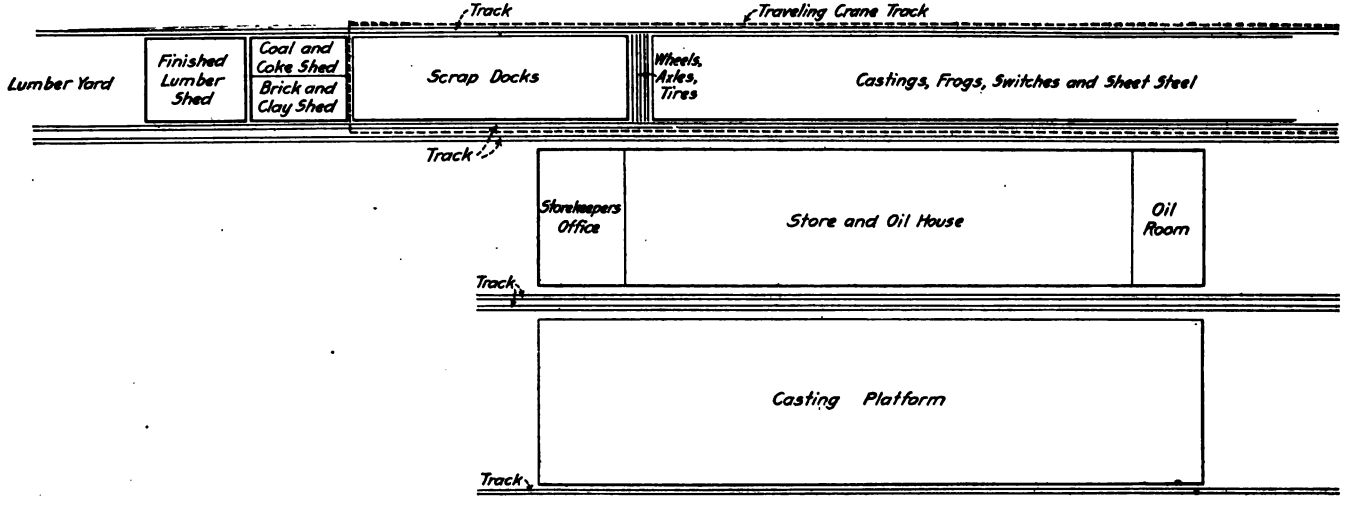
DIVISION STORE ORGANIZATION.

organization. For example, the accountant and chief clerk are consolidated, one man being sufficient to do the office work in a division organization. The requisition clerk is consolidated with the storekeeper's stenographer, and is located in the office with the storekeeper, practically works with him as his assistant, handling and registering all the requisitions, preparing the requisitions on the general store from the stock books, taking charge of and handling all the "hurries" and

correspondence in connection with the material and the storekeeper's routine work. This for the reason that the division storekeeper must be personally familiar all the time with his stock and the conditions on the division. The general foreman is consolidated and called a store foreman, is located in the store, and has direct charge of the store. The sections are consolidated into as many as may be necessary in order to conform to the forces.

For an ordinary division store, two section storekeepers inside will be found sufficient. They usually divide the first floor, one man taking one side of the open aisle, which is used as a shipping room, and one the other, their stations being located on the edge of the aisle and close to the delivery counters. In this way they will be in close communication with the shop men who call for material, and be able to advise with them and the counter boys regarding what is needed. They, more than any other men, on account of their close relation with those who are actually applying it, are in a position to make available the material to meet the actual wants that exist.

The inside organization of a well regulated division store would consist of a store foreman, two section foremen (one on each side) and counter men. The section foremen, in addition to taking care of the local shop requirements, receiving stock, etc., would be putting up and getting ready for shipment all material and supplies going outside. On the outside, stationed on the platform, would be an outside



LAYOUT FOR DIVISION STORE.

foreman, who would have charge of all material on the platform, as well as the outside labor gang. Thus each man would have specific duties laid out to the maximum of his ability and training, and would be expected to be on his particular job all the time. In this way the most efficient and economical work can be obtained.

A typical layout for a division store suitable to meet the ordinary requirements of a division is shown herewith. The division store should be located at the division headquarters. The division storekeeper is the active representative of the supply department on the ground. He is required to know personally what work is going on, what are the immediate requirements, and, above all things, he is required to deliver what is wanted when it is wanted. He should report directly to the general storekeeper.

The division storekeeper makes actual deliveries to the work by means of the supply cars. These cars are in charge of a supply car storekeeper and helper, and serves as the connecting link between the division store and the work. These cars are run on schedule and monthly deliveries are made of all material used for general maintenance and operation, such as agents', pumpers', signal supervisors' and section foremen's supplies. Details regarding the handling of these cars are explained in another chapter.

The materials and supplies required for maintenance of equipment at outside round-

houses and car-repair points are delivered in like manner at different dates during the month. These cars not only deliver the stock necessary each thirty days to these points, but pick up and bring in all scrap, surplus and obsolete material. The division storekeeper usually will spend from five to seven days on the division in this manner and thus comes personally in touch with the work that is going on, and the actual application of the material.

It must be borne in mind that the supply department's business does not end with the mere filling of a requisition, it is required to follow this material until it is actually put into use, and, further, take charge of, and assemble it after its usefulness has been fulfilled, and arrange for further use or sale as scrap. These are the direct purposes of the supply department.

The division storekeeper is in line for advancement as assistant general storekeeper, or general storekeeper. He is the most active representative of the supply department on the ground. He must maintain a thoroughly equipped and economical organization. His stock is regulated almost entirely by the deliveries he receives from the general store, the same as the stock for the general store, and the system, for that matter, is regulated by the deliveries received from the buyers.

Stock books are maintained in the division stores the same as in the general store, in fact, they are copies of them. All stock books and

stock lists are written up in loose leaf at the same writing. Thus, if there are seven divisions on a system, the seven stock books are written up at the same time. Therefore not only the same items appear at all points with the same descriptions, but they are located in the same place in the books.

SUB OR LOCAL STORES.

At all points where sufficient material is maintained on hand to occupy the time of one man in handling and accounting, principally at roundhouses and car-repair yards, a storekeeper is employed who reports directly to the division storekeeper. And it is here where the foundation is laid for the personel of the supply departments. These men are selected in the first instance because they want work. They should have a good, common school education. By their daily association with men and things, they learn, not only the actual use of every piece of material, but they come to know by personal observation its exact use, and learn without effort what it is, where it goes, and what best serves the purpose. Further, and of still greater importance, they get the atmosphere and learn the ability of the men around them, who, in turn, advance up the ladder. They know what brings about certain things, and how the business of investigating and operating is conducted. This they learn without cramming, but through every-day work, and for that reason it is never dispelled. If with this the men couple honesty, industry and

ambition, there is absolutely no question but that they will advance. It is from these men that the organization is recruited. These men serve the company's interests best for the reason that they have absolutely nothing else to do but see that the material that is actually needed to do the work is furnished, and that nothing else is maintained. They are being constantly checked up, watched and criticized for having a piece of material or a dollar invested that is not necessary. This watchfulness of the company's material becomes the unit of their efficiency.

There is little doubt but what a man will develop to bigger things if given the opportunity. This is natural. The real trouble in developing men is that not sufficient emphasis is placed on the ground work. There is too much of a tendency to glide over details.

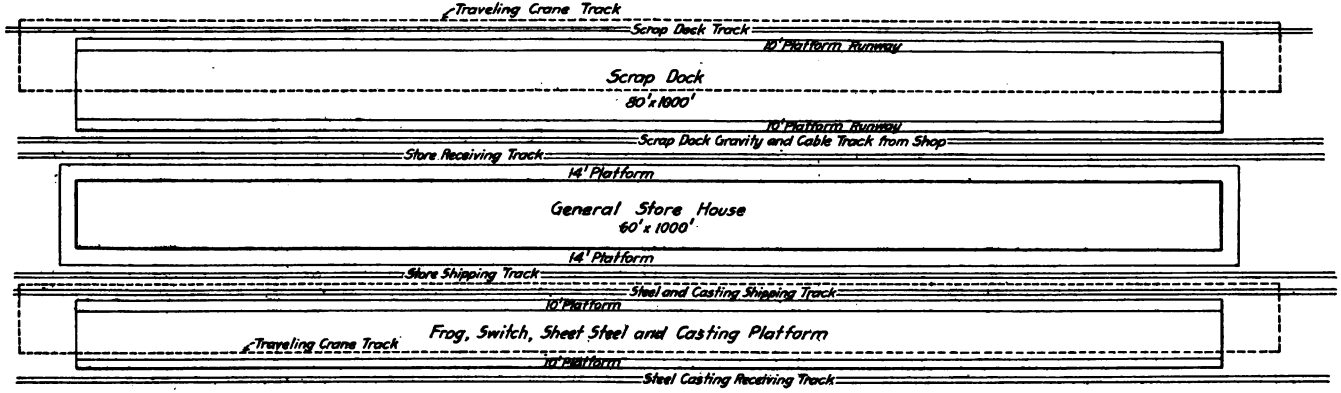
Generals are more easily obtained than privates when there are places to use them. It is a weakness of human nature that men desire to become generals before they have served as privates, but humble details always have been and always will be the basis of success. These men in the capacity of sub or local storekeepers are serving the company's real interests every day, saving them real money, and at the same time equipping themselves for a good living, and, in many instances, a career. It is the early installing of economy, industry and a thorough knowledge of why things are that makes the real capable man later.

CHAPTER V.

Facilities.

Facilities are always a necessary part of the economical operation of any plan, but we must adapt ourselves to conditions as we find them, and usually good facilities come gradually and not in proportion to the requirements. Therefore it is of much greater importance that we have an organization, for if we have the organization we can do the business even without facilities.

This can be illustrated by one instance. At Sacramento, on the Southern Pacific, an average business of between nine and ten million dollars a year is done; that is to say, about that amount of material is received and disbursed. The largest store building is 60 ft. x 140 ft. It was built 30 years ago, yet the organization is such that any material maintained there that is not delivered and on its way within 24 hours from the receipt of the requisition is treated as delayed and disciplined accordingly. The cost of operation will compare favorably with other well regulated stores, and is 50 per cent. cheaper than on many railways where this work is not under one department. The really efficient organization is the one which can deliver the goods whether they have the facilities or not, and get facilities as fast as possible.



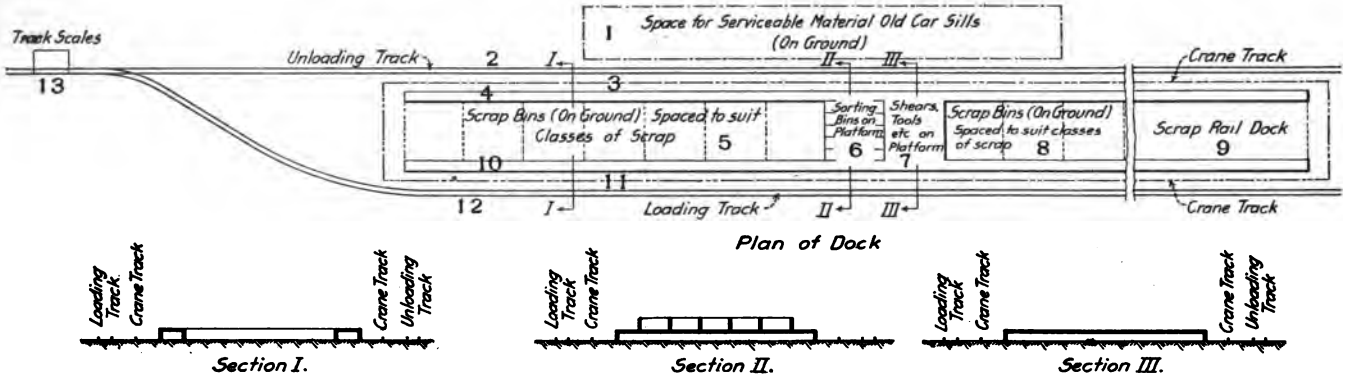
TYPICAL LAYOUT FOR GENERAL STORE.

As stated in a previous chapter, the ideal location for a general store is at the gateway of the property, and located at the principal manufacturing shops. Or, in other words, it should be as close to the market as possible; and the company's shops being its best market, it should necessarily be there. An economical lay out for a general store is shown herewith. Many supplementary facilities and details can be added to this; but the general outline of the arrangement as here shown would, to the writer's mind, present an ideal arrangement for the prompt and economical handling of most material.

Locomotive cranes equipped with generator and magnet for handling scrap, when not in use for other purposes, are recommended for all general work, for the reason that in addition to answering the purpose of handling all heavy material by power, these cranes can be used for yard switching and moved conveniently around to different places where needed.

There should be located on every division a well-equipped division store. Sub-stores will have to be maintained locally in connection with the oil houses at roundhouses and car repair stations. In all instances enough ground can be cleared off to lay old car sills, on which to erect racks and platforms sufficient to segregate materials. There should always be a shed to protect lumber and materials which might be damaged by exposure.

If I were to say what one facility I consider most important for the proper handling of



ARRANGEMENT FOR A GENERAL SCRAP DOCK.

1. Space for serviceable material made from old car sills on ground. 2. Unloading track full length of dock and rail docks. 3. Track on ground for gantry electric crane. 4. Platform 8 ft. wide full length of docks, height of car floor. 5. Scrap bins; no timber used; scrap piled on ground, and spaced to suit various classes of scrap. 6. Sorting bin; on platform about 50 ft. square with 10 small bins, built height of car floor. 7. Platform about 50 ft. square for shears, tools, etc., used for cutting scrap, etc. 8. Scrap bins; same as No. 5. 9. Scrap rail dock; used for rail, fireboxes, boilers, etc.; crane to run full length. 10. Platform, same as No. 4. 11. Track, same as No. 3. 12. Loading track. 13. Track scales. Note.—Scrap dock to have gantry electric crane, 5-ton capacity, at least 50 ft. from leg to leg, with 18-ft. cantilever each end.

material, it would be space, and this is always available. The storekeeper who offers as an excuse for the mixed-up condition of material that he has no storehouse or place to put it never will be a storekeeper, no matter what facilities are furnished him.

SCRAP DOCKS.

Probably one of the most necessary facilities for handling scrap, surplus and obsolete materials is ample and sufficient trackage and docks for sorting, receiving and shipping. There should be one general assembling dock located at a point on a system where most of the scrap would naturally accumulate. This would, of course, be at the company's manufacturing plants, where everything possible will be used in its industries, rolling mills, foundries, etc., and everything available worked over for future use. If possible it should be situated at a point as close to the company's source of supply as the road will permit; in other words, at the gateway. It is, of course, necessary to have local scrap docks at the division shops, but the general scrap docks are of first and greatest importance.

In arranging them the first consideration must be room and trackage, for they must be available by ample track facilities for economical and prompt switching. A modern, general scrap dock with modern appliances is shown herewith. It provides for using electric magnets, either with a locomotive or a gantry crane. The idea is that with the use of the mag-

net it is not necessary to have docks for the scrap. This expense is thus saved, and the additional room made available, but for sorting it is necessary to have a platform. The magnet picks up the scrap and the operator spreads it over the surface of the dock when he releases the current, thus enabling the men more quickly to segregate the material than they could by picking it out of the pile. The opposite side is utilized for assembling usable material recovered from the scrap. Located here are the shears, hammers, bolt cutters and other necessary tools for working over and making usable such material as can be recovered; at the same time it is all piled up and made accessible for use.

In laying out this plan the writer had in view the use of traveling cranes for loading and unloading, equipped with generator set and electric magnet. Much money is now lost in handling scrap, in fact a great many roads are actually spending more money in handling and recovering scrap, etc., than it is worth, and unless the very best facilities are provided, and a permanent and efficient organization is maintained solely for the purpose of handling scrap, these losses will be very considerable. A great saving in handling scrap is the good material that is recovered, and no matter how careful men are along the line, at outside and division points, in sorting and handling scrap there is bound to be a large quantity of serviceable material loaded and shipped in as scrap, so that

a second or third sorting is necessary. This has been clearly proven by accurate records.

DIVISION DOCKS.

The plan of the docks at division shops must be determined very largely by the conditions and location of the shops and car repair yards, and it must be taken into consideration in laying out these docks that the cost must be figured from the time of the first removal of the scrap. The docks or bins should be located as conveniently as possible to the shops, at the same time being made accessible by tracks, and so arranged that the miscellaneous scrap made in and around the shops can be delivered directly from the machine or pits, either by wheel-barrows or by tram cars, with the least possible expense. Scrap coming in from off the division can in many cases be loaded in such a way that it can be billed straight through to the general assembling dock, but in many cases this is not possible and should come to the division docks, where it should be sorted over and reloaded. The purpose of this is to give the division the benefit of serviceable material which may be found, and to encourage division officers to exercise greater care in the removal of material that may be used again.

The accumulation of scrap in the car repair yards usually can be loaded up directly from the ground to the cars and shipped to the general assembling docks. Where any considerable quantities are accumulated, bins can be located at convenient points, and the scrap

segregated into them in order to keep the tracks clear. About once a week these bins should be cleaned up with the crane and magnet.

The crane and magnet can be utilized, as explained in another chapter, for loading scrap at division points. About every week what there is on hand should be loaded and shipped to the general docks, or for sale, as the case may be. A careful record should be maintained at both division and general stores of the cost per ton of handling scrap of different classes, and a detailed statement in dollars and cents of the material recovered from the scrap should be made up monthly and sent to the general storekeeper.

The scrap docks on our railways are doubtless the best source of education for men engaged in buying and handling material. Here is where we find the results from actual service tests. Here our operating and maintenance officials can teach their men valuable lessons in real economy. They can see the enormous amount of available and usable material which has been removed, either from the track or equipment, that probably, in most cases, could have served its purpose for a longer time. It is apparent that if this material is serviceable at all it could have given its best service where it was. Not only should the loss of material be considered, but the labor connected with replacing it. The truest economy is never to remove anything until it has entirely outlived its usefulness. The volume of usable material

recovered from our scrap docks is a living evidence of extravagance, and a campaign along this line, and with this evidence, will bring real results.

SUPPLY CARS.

The supply car is the connecting link between the division store and the users. Here let it be understood that the storekeeper is responsible for all unapplied material, that it is in his stock until it is put in use, and that he is responsible for it until it is actually applied. Each division should be equipped with at least two supply cars, and as many more as the requirements may demand, one car equipped with the necessary tanks for handling and distributing the oil, the other equipped with the necessary shelving to segregate the miscellaneous supplies required. These cars should be of 50,000 or 60,000 lbs. capacity, equipped with 4-wheel passenger trucks, steel or steel tired wheels, heavy underframes, and reinforced draft rigging. One of the cars should have two berths, toilet, a small desk, and, when necessary, a cook stove and small commissary for feeding the men. The oil car should be equipped with both air and hand pumps, the air to be used wherever it is necessary to draw any large quantity of oil, and at the same time the hand pumps can be used for filling smaller orders. The air may be taken from the train pipe and reduced by reducing valve.

In addition to the regular supply cars, as many ordinary cars may be taken as the de-

mands require; for example: a car for spikes, bolts and other track material, a car for available stock, and as many cars as necessary to pick up the scrap and obsolete material which will be offered.

These cars operate over the division on a schedule prepared by the superintendent several days in advance of their movement. This schedule shows the dates and train numbers governing their train movement over the division. These schedules are placed in the hands of all concerned: i. e., trainmasters, yardmasters, division engineers, roadmasters, section foremen, agents, signal supervisors, signal maintainers, pumpers, etc., who are required to be on hand to receive and deliver their material. On the days on which these trains are due, the section foremen and section men are detailed to work inside the station grounds so as to be able to meet these cars and receive their supplies, and load all surplus and scrap material and tools which they may have on hand. This is assembled at their tool house convenient for loading as soon as the cars are spotted.

The requisitions, after being approved by the proper officials, are turned over to the division storekeeper before the car starts out, who is then in a position to know approximately what stock to put on them. These requisitions are then arranged in station order on clip files and placed in the hands of the supply car storekeeper. The division storekeeper accompanies these cars, with as many

of the other division officers as possible, and the roadmasters over their respective districts. The division storekeeper delivers on the ground what he finds to be actually required, with the approval of the division officers on the ground at the time, irrespective of what the requisition calls for, and takes receipt for same on the face of the requisition.

The receiver of tools and other materials is required to return old tools and parts as vouchers for the delivery of the new. These tools and parts are either repaired and made available again, or scrapped. He is also required to turn over all surplus and obsolete material of every kind which he has picked up during the month on his section. The tool house is checked against the standard list of tools, and any surplus or obsolete tools are taken up. He is also allowed to draw additional tools or material which may be found on examination to be necessary, in order to meet the requirements which exist at that time. Gasolene, distillate, etc., are delivered in like manner, and receipts taken. All old material, scrap, etc., delivered is receipted for, and credit allowed the proper section from which it was received.

These cars are required to deliver substantially everything that is used in ordinary maintenance and operation in the way of agents' and section supplies, pumpers' supplies, signal material, and in fact everything with the exception of lumber, which is shipped from the general material yard. They are

also required to pick up all scrap, obsolete and serviceable material of every kind found on the right of way, and in and around stations. At the same time a thorough inspection is made of all buildings, and at stated periods the general storekeeper and the superintendents accompany these cars and make a thorough personal inspection of the division. As soon as a carload of scrap or available material is made up, it is billed back to the division or general store, as conditions may determine.

It requires four or five days to cover an ordinary division. The balance of the month these cars are engaged in making deliveries on specified dates to the sub or local stores, roundhouses, car repair yards, etc. The cars go on local freights and are set out at sub-stores, roundhouses and car repair stations. The material is actually delivered by the supply car storekeeper to the local storekeeper. The oil storage is filled from the cars with the air arrangement described above. All surplus, obsolete and scrap in and around the shops and storehouses is picked up and taken back.

In this way a thorough inspection is made of each local repair point each month, and there is absolutely no excuse for surplus material being maintained at these points. The supply car storekeeper, representing the division storekeeper, will see that it is all picked up and brought in, as well as lending whatever assistance may be necessary in delivering and arranging the material that may be required.

These cars have been found of the greatest

service; in fact they have, to a great extent, solved the most important question connected with the handling of material; that is, its delivery and the keeping of the road clean of unnecessary and useless material that has been assembled by employees because of uncertain deliveries. These cars are further used for delivering material to large jobs, and going to points where work has been under way and material left over, and picking it up and bringing it in.

CHAPTER VI.

Requisitions and Orders.

We have now the organization and facilities, and are prepared to do business.

FORM OF REGULAR REQUISITIONS.

Each person having authority to order material should be required to make out a requisition on the form provided, and in the way instructed, and obtain the approvals prescribed. The requisition form shown on page 50 contains only essentials, with ample room to describe what is wanted, and nothing except what is wanted. Instructions regarding the use of this requisition may be changed from time to time, but generally speaking the substance of these instructions is that the person making a requisition must state correctly and technically the thing he wants. In the case of requisitions for material regularly required, they must conform to the standards, as shown by the standard lists.

For the purpose of further identification, and to prevent mistakes, each item on the standard list should be indicated by an item number. This number indicates, not only the number of the item but the section in the storehouse in which it is located. Thus 13-1 indicates that the item described is located in section 13, and is item 1 on the list. The list is arranged alphabetically and in sections, and

also shows the technical description. They also should be required to show the actual amount on hand and amount due; and, in the case of stock requisitions, the average previous months' consumption. This information, together with complete shipping instructions, forms practically all the essential information that is required.

FORM OF SPECIAL REQUISITIONS.

Special requisitions must be prepared to cover all special materials, tools, etc., which are not carried in stock, and are not shown on the standard lists, as indicated above. These requisitions, in addition to giving complete description of what is wanted, must indicate why it is wanted, and its approximate value, and be approved by the head of the department, with full explanation as to why it is required.

FORM OF STATIONERY REQUISITIONS.

There is a separate requisition made for stationery, owing to the character of this material. Form numbers answer for item numbers, and besides, stationery is usually ordered on basis of three months' supply. That is to say, the system is divided up in such a way that requisitions are made on the basis of each three months. This saves much unnecessary time in shipment, and has been found practical and profitable. A sample requisition is shown on page 52. Only one form of requisition is necessary, of two different sizes, half and full sheets.

File No.....

Section No.....

REQUISITION FOR MATERIAL. *NO*.....

.....190....

TO....., AT.....

Please ship the following material to

.....

Approved..... Approved..... At.....

Title..... Title.....

On Hand and On Order.	Average Monthly Consumption.	Additional Wanted.	Description of Material.	Purpose.	Leave Blank. For Accounting Purposes.

FORM OF REQUISITION FOR MATERIAL.

Actual form measures 8½ in. wide; half and full sheets.

FORM OF SHOP ORDERS.

A form of shop order is shown on page 54. It is used by local shops in drawing material from storehouses at all points. Usually it is made out by the shop foremen of the different shops, and can be made out in their own way, for the reason that they have not the time to study the standard lists, drawings and schedule references. Besides, the connections between the user and the material is such that all this information can be procured in another way, as will be explained later. At the shops, where the delivery system is installed, the order is telephoned to the section, and delivery made by messengers, who in turn take receipt when the material is delivered, and deliver the order back to the section storekeeper, who in turn puts on the technical description and item reference from his stock books. In cases where the shop delivery system is not in use, and the men go to the counters and get the material, the counter foreman and section foreman in the storehouse enter the correct description on the tickets in the same way, so that when the tickets go into the office for accounting purposes, the description is technically correct and identified in the same manner as the requisitions.

REGULAR REQUISITIONS; METHOD OF HANDLING.

The requisitions, after being properly approved, are forwarded to the division store, they are identified by a number and registered,

Form 2081. C. S.

Sheet No.....

STATIONERY REQUISITION No.....

File No.....

TO STATIONER: .....19....

The following supplies are required at.....*for the*.....*ending*.....19.....

Approved: *Approved:*

....

[*TITLE*]..... [*TITLE*]..... [*TITLE*].....

INSTRUCTIONS.

1. Requisition should be made on dates designated by proper official and should cover sufficient stationery to last until stock ordered on next requisition is received.
2. Requisitions should be written in copying ink or indelible pencil and an impression copy taken by the maker.
3. The "Number on Hand" at time of making requisition must be shown in the column provided for that purpose.
4. Blanks bearing form numbers must be listed in numerical order, followed by Miscellaneous Supplies.
5. DO NOT INTERLINE ON THIS BLANK. Use one line for each article.
6. When material called for by requisition is received, it should be checked with the impression copy, and any discrepancies noted thereon.

FORM.	DESCRIPTION.	Number on Hand.	Number Required.	VALUE.	REMARKS.

FORM OF STATIONERY REQUISITION.

Actual form measures 8½ in. wide, full sheet.

and show the date received, original number, file number, brief description of what it is for, and what was done with it. They are then checked against the available material, as shown on the stock lists, and notations made after such items as can be supplied from outside points. They are then arranged according to section and delivered to each section storekeeper, who first checks the column "Amount Due" to see that the back-orders which he has for this material agree with the amount which they show is due. For example, if their requisitions should show that they want one dozen hand saws with none due, and the section storekeeper found he held a back-order for one dozen, he would cancel the item, making notation to the effect after same that there was a dozen due that they did not know about. All duplications are discovered in this way. He then checks the descriptions against his stock books to see that the material is properly described and itemized, and at the same time compares the quantity ordered with his stock books, or what he is using himself of this class of material. If it shows extravagance, or is excessive, he makes notation after the item to this effect. In fact, the section storekeeper in the division store censors every item on a requisition for stock for the division, and is in effect general storekeeper of that division for his particular section. In the same way the section storekeeper of the general store censors all requisitions from the division stores for stock, and is general store-

Form 4218 C. S.

ORDER ON STOREKEEPER

.....191....

TO STOREKEEPER:

Please deliver to bearer the following material:

Charge Acct. No..... *Shop No.....*

To be used for..... *Store No.....*

.....

.....

Class.	ARTICLES.	Material Released.		Material Issued.		
		Kind.	Quantity.	Quantity.	Price.	Amount.

This blank to be used by the M. P. & C. Dept. in drawing material from the Store Department.

If for repairs to Locomotives, it must show whether for "Shop" or "Running" Repairs. If for repairs to Cars, separate requisitions must be made for each subdivision of each account. Issues must be shown in "Material Issued" column, and Scrap or serviceable material released, in "Material Released" column. Under "Material Released" show whether second-hand or scrap; if the latter, show the kind of metal. Issues must be priced and extended by Store Clerks.

.....

.....

(TITLE)

FORM OF ORDER ON STOREKEEPER.

Actual form measures 8½ in. x 4½ in.

keeper of his particular section for the system.

His next move is to make a cross at the left of such items as he has in stock and provided for. The messenger then comes around and picks up the requisitions so marked, and then takes them back to the storekeeper, who personally goes over notations made by the section storekeepers, and makes such changes as he may desire, and indicates after the items on the requisitions which have not already been provided for, what action shall be taken. For example, one item he will mark "Purchase," another "Shop," meaning in the first instance it will be bought, and in the second it will be made in the shops.

The requisitions are then turned over to the requisition clerk, who first draws off transfer requisitions for such items as can be supplied from outside points where it is not needed; second, he makes requisitions on the purchasing agent for such items as it is necessary to purchase; third, makes store orders on the different shops for such material as must be made or repaired in the shops, indicating after these items the action taken, i. e., the order numbers and dates. The requisitions are then sent to the section storekeepers, and the preparation for shipment commences at once. Several different sections will thus be working on the same requisition at the same time.

As soon as the material is ready for shipment, the shipping foreman, who has already made arrangements for the necessary cars to

load, is notified. The requisitions are taken up by him, the material checked into the cars and turned over to the agent, who is also located (in case of the general store) in the store for billing. The number and date of the waybill, car number, etc., is indicated on the requisition and turned over to the manifest clerk, who immediately makes the invoice from the original requisition, and mails it out. This work at the large stores is done at night, so that in all instances the consignee has a manifest in his possession before the material is received. These invoices are usually made in triplicate, one copy going to the consignee, one to the maker of the requisition (usually the superintendent), and the other remaining on file. The shipping notice, or manifest number and date, is then entered on the original requisition, and the requisitions filed numerically by divisions. The unfilled items on the requisitions are drawn off onto back-orders, and when these back-orders are filled they are handled in the same way, and attached to the original requisition, so that the original requisition in the storekeeper's office shows at all times its exact status, and can be located instantly by reference to the number or date.

SPECIAL REQUISITIONS; METHOD OF HANDLING.

Special requisitions when received at the division store are merely registered in the same way as regular requisitions, and forwarded to the general storekeeper, who obtains any additional approvals which may be necessary,

and prepares at once a purchase requisition to cover, sending a copy of same to the division storekeeper so that he may be in position to advise division officers what action has been taken. In this way these requisitions are delayed no longer than is necessary to get the necessary approvals and time to check against what may be available or can be supplied. They pass through the division stores and general store to prevent anything being bought which may be on hand or can be made applicable.

STATIONERY REQUISITIONS; METHOD OF HANDLING.

Stationery requisitions are prepared by the agents, approved by the superintendents, and, in the case of general officers, approved by the heads of the departments, and sent directly to the stationery storekeeper, who handles them in the same way as other requisitions.

SHOP ORDERS; METHOD OF HANDLING.

Shop orders are checked over every night by the section storekeepers to see that the description and item references are technically correct, and delivered to the material clerk, where they are abstracted to their proper classes and charged to the proper operating accounts.

STORE ORDERS; METHOD OF HANDLING.

Store orders for shop work to be done in the shops are made by the storekeeper of the shop under whose direction the material is to be made, and sent to the local mechanical official

or shop superintendent, as may be directed, for approval. These orders are all numbered and made in duplicate. Whatever material is necessary to do the work is ordered by him, and charged to this order, as well as the labor. When the article is completed the storekeeper, or store delivery foreman, is notified, takes the material away, and gives receipt for it, which is authority for the shop clerk to prepare bill for the value of same.

PURCHASE REQUISITIONS; METHOD OF HANDLING.

Requisitions are made on the purchasing agent *only after every other resource has been exhausted.* All purchase requisitions are made at the general store, and if for stock are based on the general stock books, which show the technical description of the material required with such schedule, drawings, pattern, and other references as may be necessary. This record also shows the quantities which have been purchased during the year or years, amount on hand and amount due. From this information the storekeeper determines the quantities necessary for him to provide, taking into consideration his personal knowledge of any changed or unusual conditions. The requisition is then prepared, checked again by the general stock clerk against the general stock books to be sure it is correct in every detail, certified to by him, approved by the division storekeeper and general storekeeper and forwarded to the purchasing agent for execution.

In the case of special requisitions the method of procedure is the same, except that all such requisitions are made in the office of the general storekeeper, and after the necessary approvals have been obtained from the heads of departments, and when necessary from the general manager or chief executive officer.

The purchasing agent upon receiving these requisitions, will, if covered by contract or agreement, indicate at once the proper contract reference. If the item or items are not covered by such agreement, requests for bids should be sent out immediately, stating the time the bids close. When such bids are received they are tabulated and the purchasing agent decides, and indicates by a circle the bid accepted. It is attached to the requisition and sent to the order clerk, from which orders are made in triplicate, one copy going to the seller, and the other to the storekeeper, and the other being filed with the requisition. The storekeeper upon receiving this copy checks it against the requisition and calls the purchasing agent's attention at once to any changes or errors which may have been detected. It is then sent to the section storekeeper, who will receive the goods, and it is attached to his duplicate copy of the requisition from which to check the specifications when the material is received.

CHAPTER VII.

Receipt and Inspection.

PURCHASE BILLS.

Purchase bills or invoices are supposed to be made by the seller on the dates the material is shipped, and sent in triplicate to the purchasing agent. These bills in all cases give reference to the orders and requisition numbers, and are first checked by the purchasing agents against the copy of the order to see that they agree in the matter of price, routing, etc., the triplicate being retained in his office, and the original and duplicate forwarded to the storekeeper. The storekeeper enters it against the item on the requisition record book, that is, he gives the date shipped, name of the shipper, amount of the invoice, routing, etc. As soon as the material is received and entered against the requisition record he checks them again for receipt of the material, and certifies to receipt of the material, giving reference to the date and book upon which it is entered, retains the duplicate for his file, and returns the original to the auditor for voucher. The purpose of the first check is an advance notice that the material has been shipped so it will not be necessary to trace for information already possessed.

FREIGHT BILLS.

The freight bills are prepared by the agents at the points where the goods are received, and

forwarded by him with the goods in triplicate, one portion being receipted for by the storekeeper when he receives the goods. These are matched against the receiving records by the dates, waybill and car references, and checked against the copy of the purchasing agent's order to see that the routing is in accordance with same, any notations regarding the freight rates, etc., entered and after being checked regarding extensions, etc., they are attached to the purchase bill, and deductions made from the face of the purchase bill for any freight charges which may have been assumed in accordance with the terms of purchase. The duplicate remains on file with the duplicate purchase bill in the storekeeper's office, and the original is returned with the original purchase bill as voucher for the deduction to the auditor. It is the business of the storekeeper not only to check additions, extensions, etc., but to see that the correct rate is applied as well.

RECEIVING FREIGHT.

No freight should be taken from the cars without the waybills. Storekeepers should insist on getting the waybills or freight bills before a piece of material is removed from the cars. This is one of the first precautions that should be taken to prevent mixups and trouble. The waybills being received, they are placed in the hands of a receiving foreman, who arranges them on a clip, and when the cars are set personally supervises the unsealing of the cars, indicating their condition, seal record, etc.

He then as closely as possible inspects the exterior appearance of everything that is checked out, checking off the pieces on the waybill, that is—bundles, boxes, or however they may be grouped, and indicates their condition if there is anything apparently wrong with them. He delivers these bundles, packages, etc., to the respective section storekeepers, and, together with the signed waybills, turns them over to the section storekeeper for detailed checking.

The section storekeeper is equipped with what is known as hip pocket freight received book. It is a book about 8½ x 3½, ¾ of an inch thick, so it can be conveniently carried in the hip pocket. The idea of this book is that it makes a permanent record, and is big enough so it can be permanently filed. It is the original record of the material as it was received, and is made so as to be carried in the hip pocket so that the man who checks and puts away the freight has both hands free. A loose check is constantly being mislaid, with the result that the receiving books are usually nothing more than abstracts from memorandum slips, and the like, and are not reliable. In this book are first entered: Date, car number, initial, waybill number, details—thus: 1 bundle, 1 box, 1 package.

The boxes, packages, etc., are then unpacked and laid out in the section. If there is a packing list with it, it is compared first with the copy of the order, and then with the material. If there is not it is compared with the order, the

identification marks, order number, etc., usually appearing on the box or on the package. If there is a discrepancy, it is called to the attention of the store foreman to witness the inspection and check. He then enumerates the material in detail after having verified it as above, gives its exact condition, if it appears in bad order the apparent causes, and is the man on the ground who actually knows what is received. He has to aid him in this check: First, his stock book; second, copy of the requisition; third, copy of the order; fourth, the check list, if there is one in the package.

The material is then put away in its proper place, and the book is called for daily by the freight received record clerk, where it is entered up in detail against the requisition, from which the purchase bills and freight bills are checked. The men carry two books, one for the odd and one for the even days, so that they always have their freight received book with them, and at the same time the office is not delayed in keeping up their record of freight received. This is always done daily. In receiving freight in storehouses, the most important detail is to have it carefully inspected, checked, marked and put away, so that it can be located instantly for delivery or shipment. The importance or this will be shown later.

INSPECTION.

The inspection of material by storekeepers is a feature which has never been appreciated or understood. It is the most practical and

useful inspection there is. A great deal of material is bought in accordance with specifications, and most large railroads have an inspection bureau in charge of an engineer of tests, whose duty it is to see that the material conforms to the specifications. Usually this inspection is made at the mills or factories where the material is made, so as to save the expense of freight to point of delivery. Where it is all subject to inspection at point of receipt, the order so specifies and the storekeeper makes request on the engineer of tests to have the material inspected, receives his certificate and files it with the duplicate purchase bill. When material is inspected at factories or mills, the inspector's certificate is attached to the original purchase bill, and reaches the storekeeper through the regular channel in the same way. This is only one inspection and applies to but a small portion of the material used by a railway.

The other inspection is necessarily made by the storekeeper, and an organization so systematized that there is a specialist in charge of each class of material, a man who knows the actual use to which it is applied, and is in touch with its use every day and with the men who use it on the ground, is the man to inspect this material. Upon him we must depend, not only for the company's getting the weight and quantity it is charged with, but also for its getting an article which is best suited for the purpose for which it is used. He has not only his knowledge of the use of the material, and

similar kinds on his shelves, but in many instances he is provided with samples with which to compare, and it is remarkable the things which are discovered every day in a well organized general store on a railway where practical inspection is carried out to its full usefulness.

With our large railways buying enormous quantities of material, practically on the basis of price, the company must protect its purchasing agent by inspection. The buyer is not in position to know what the article is that he is purchasing. He must depend as much on the storekeeper for seeing that he gets what he intends to buy as that he gets the quantity and weight bought, and this work can only be done by the storekeeper.

Thus we have a man who actually orders the material, receives it, inspects it, puts it away on the shelves, and delivers it or puts it up for shipment with his own hands.

DIRECT SHIPMENTS.

A great deal has been said on this subject. It offers a favorite criticism from those who are not familiar with the details of the supply department. Like many other so-called economies, at first blush it would appear to be more economical to have material shipped directly to the work from the manufacturers, mills, etc., and naturally jobbers and other business houses encourage this among railway officers and purchasing agents. Their claim is that it saves the company carrying the stock,

saves handling, back-hauls, etc. All of these claims are more or less fictitious and unsound.

First and most important, it is absolutely impossible to check and inspect material that goes directly, any statement to the contrary notwithstanding. Of course, it may have been inspected at the mill by our inspectors, but in more cases it has not, or it may be changed after it was inspected. So far as the check is concerned, the men that get the material out on the road for the work are interested only in their work, and not in a careful inspection and check of what they get. The chances are they do not check it until weeks afterwards, until they get the bill, and by that time it is used up, or gone somewhere else.

Secondly, there is no necessity for carrying the material in stock just because it is passed through the storehouse. In fact it should not be done. If it is special material, that is, material that is not ordinarily carried in stock, or more of it than is ordinarily carried in stock, and is ordered only for some particular work, it goes through the storehouse, is inspected, checked and forwarded to its destination. Nine times out of ten, if less than a carload, it can be put in with other material going the same direction and make a carload; or, if it is a carload, it can be rebilled to destination, so that there is no unnecessary car haulage.

So far as saving back-haul is concerned, it is another so-called economy that is greatly exaggerated. *There is hardly ever a train that has not empty cars in it.*

Of course, it is not intended that this plan should be followed out entirely. It would be ridiculous to do that. Lumber, bridge material, steel bridges, large shipments of all kinds and nature will, of course, be inspected at point of shipment, loaded and shipped directly to the work. I am speaking of the general run of stock or special materials that are used on a railway. Generally speaking, it should all pass through the storehouse, where it can be properly inspected and checked by an organization trained and paid for that work.

UNLOADING OF CARS.

Probably no more important work falls upon a thorough supply organization than the prompt and economical release of equipment. Car unloading has been shamefully handled on our railways in the past for many reasons:

First—Imperfect and uncertain switching service.

Second—Lack of necessary help to do the work.

Third—Lack of the proper organization to see that it is done.

Switching must be done as promptly and as accurately for the company as for the individual and the storekeeper must be in position to demand proper switching service.

The system of having laborers in other departments unload cars is wrong and should not be permitted, except at points where there is not sufficient work to keep the necessary number of men busy all the time handling com-

pany material. At all other points storekeepers should have sufficient men to promptly unload and release the cars. His organization must be such that he may know the exact time every car is received in the yard, arranged to get the waybills, have the car spotted at its proper place and track, men ready to release the car, and have it promptly reported as an empty, or assigned for reloading.

A daily record of this kind will work wonders in releasing equipment, and will save enormous sums of money by making equipment available when it is needed. There is no excuse for company material remaining under load longer than twenty-four hours, under any well organized supply system.

CHAPTER VIII.

Filling Requisitions and Pricing.

We have now received our stock and are ready to fill requisitions; or, in other words, we have arrived at the point where we are in shape to carry out the real purpose of the entire organization.

The handling of requisitions has been explained in considerable detail in previous chapters, but for the benefit of the men actually doing this work, it will be proper to more carefully review this important feature.

To start with, we must assume that the organization has been perfected to an extent whereby requisitions will come to the section storekeepers accurately prepared, but if they do not the section storekeepers by means of their organization, that is, their stock books with everything technically described and numbered, are in a position to correct them, and they should do so at once. The requisitions are laid out in each section for filling, and the material packed and plainly marked, giving reference to the requisition number and date, and laid out together with the requisition in the aisles ready for the shipping crews to pick up when the cars are placed for loading. A bulletin is issued each day in the larger stores, showing cars that will be loaded, and where they are spotted. Placards are also put on the cars to prevent mistakes.

The shipping crews pass through the different aisles, the foreman takes the requisitions and checks the material against them, they are loaded into the car in proper station order, the car number entered on the requisition, and the bills delivered to the agent. In the larger stores, the storekeeper is also the agent. At the smaller stores, a shipping notice is prepared and delivered to the agent, from which the billing is prepared.

It is the further duty of the store foreman to see that these cars actually get out of the yard, and report every morning to the storekeeper any cars which are not pulled out. This for the reason that it must be borne in mind that the storekeeper is responsible for seeing that the material is actually delivered where it is wanted, and it serves no good purpose for him to have a receipt for the billing, it is his business to see that it gets there.

The requisition, together with the waybill number and date, and car number, is then delivered to the requisition clerk in the storekeeper's office, who enters the date it was shipped, checks it off, and turns it over to the invoice clerk, who prepares a shipping notice or manifest and invoice at one writing. One copy goes to the consignee, another copy to the maker of the requisition, and the third copy is the invoice, which is afterward priced, extended, and goes to the department having charge of the accounts, usually the division superintendent. The first two copies are identical with the invoice, and made at the

same writing, and are, therefore, an invoice in every respect, except price and extension, which cannot be made until later, owing to a good deal of material being made or repaired in the shops, the prices for which are not worked up until the end of the month, or for other reasons.

The purpose of this is to place in the hands of both the maker of the requisition and the consignee a bill for the material before the material arrives. At the largest stores this work is done at night, that is, where there is sufficient to do to keep one man busy it is best to have it done at night so that in all cases these advices will be in the hands of the men who receive the material before the material can get there.

The original requisition is then filed numerically by divisions, and shows, on its face, car number and date of shipment, waybill number and date, invoice number and date, and forms the original record, from which all information is given. Anyone inquiring about this requisition only has to give the number, when every detail regarding its handling is apparent on its face.

Any back-orders, that is, items which are not on hand, or were not ready for shipment at that time, are abstracted therefrom, and will, when filled, pass through the same channel and be attached to the original, so that there are two places the requisition may be found, either on file in the storekeeper's office, arranged numerically under its proper division, or in the

section storekeeper's station in its proper division.

The most important feature to bear in mind in the handling of requisitions is promptness. This cannot be too earnestly impressed on all concerned. The great fault of our storekeepers is the useless routine and delay in handling their requisitions.

PRICING.

There is no more important work than pricing, and it is something which has never been given the attention it should have been. Prices must, of course, be accurate, but they must also be in shape so they can be gotten at. There is more guessing done on account of prices being hard to obtain than for any other one reason. Another cause of erroneous pricing, and often ridiculous pricing, is that the price clerk is not able to identify the description on the requisition with the description in his price book, and the system which has been outlined has had this point always in view. For this reason the stock books are all written up at one time, which insures the same description appearing at every point on the system. Requisitions and shop tickets are checked against the stock books and the proper descriptions inscribed thereon. Requisitions for material are made up from the stock books, so that the same description appears on the requisitions. The purchase bills are checked against the requisitions, and the descriptions on the purchase bills changed to agree with the descriptions on the

requisitions, so that the duplicate purchase bill in the storekeeper's office, from which the prices are taken, bears exactly the same description as that on the requisition and shop tickets. Besides the price books are revised every year in the same way as the stock books, further insuring the same descriptions appearing in every transaction. Therefore, when the price clerk gets his requisitions and shop tickets, he has the correct description before him, and can identify it instantly with its correct price.

The most satisfactory price book is loose leaf, plain book without any printing on it. It is ruled up in such a way that it will show only the year and the requisition number, thus:

1909. 444.

Item 1—Adzes, R. R., 5 inches wide.....doz. $5.50

meaning that this price obtained for requisition 444. The reason for putting in the year is that we change the numbers of our requisitions yearly, commencing with 1, and the reason for putting in the number of the requisition is that by turning to this requisition you can locate the entire transaction, e. g.,

Number and date of requisition,
Description of material ordered,
Date it was received,
How it was received,
From whom it was received,
Point of delivery,
Actual cost, including freight,

and this entry can be made, in the smallest possible space, with the least number of marks

of the pen. Giving the consignee's name and address, and all that sort of thing, only makes your price book bulky and destroys its usefulness.

The reason why I prefer loose leaf price books to cards is that they are more permanent, and not so likely to get mislaid and lost as cards, and for the further reason that six or seven price books can be written up at the same time with carbons on the typewriter on good bond paper, thus insuring the same description in each one, and the location of the item in the same place.

Store orders are handled in exactly the same way. The prices are simply taken from the store orders, and reference given to the store order number, indicated by "S. O."

The same persons should do all the pricing. They should make a business of doing pricing and nothing else. In this way they become accurate and quick. No set rules regarding changing of prices can be carried out, good judgment simply must be used. The most satisfactory plan, I believe is to have yearly prices, that is to make up the prices once a year and maintain these prices during the year with certain exceptions, the loss or profit owing to fluctuation in prices being applied to the proper accounts at the end of the year by the auditor. In this way every division is treated the same, with result that the operating expenses are not influenced in any way by different prices on different divisions or dis-

tricts. After all figures are only of use for comparative purposes.

This, of course, simplifies the price book very much, it only being necessary to write up the price book once a year, as explained above, the prices remaining the same for everything on hand at that time during the year.

CHAPTER IX.

Assembling, Marking and Loading.

ASSEMBLING OF MATERIAL.

This is undoubtedly the hardest and most important matter with which our supply departments have to deal. There are so many things entering into it that it is hard to lay down any iron clad or fixed rules, but it is recognized as being necessary to have material for a job all go at once. Instead it is the rule to ship everything just as soon as you have it. There are many reasons for this. First, under the theory that it saves handling, etc., a great deal of material for a job is ordered directly, which may come at any time and all times. Second, if it comes through the store, the storekeeper is anxious to reduce his stock, he wants to load it out and get rid of it, and get credit for it. Third, it is the easiest way to handle it, and everybody wants to do everything the easiest way.

The result at the other end is different. A man is going to start a building. The first thing he will probably receive is the shingles, a latch or lock. By the time he gets his foundation material and lumber, the hardware is stolen or used somewhere else. When he gets the building pretty well along, and everything ready, he will find he has not his doors or windows, and he will probably have to shut

down the job and move his gangs to another point. Another feature—the material comes dribbling along; first there will be a car of cement, a car of brick, and then a car of rough lumber, some hardware, plumbing, etc. Then he will have to send a gang of men a considerable distance to unload it and take care of it. This is another feature of direct shipments which is always overlooked when being discussed, and one of the reasons why it is not practical to make direct shipments, even of lumber, generally speaking.

So that the proposition which confronts a supply organization is to move material for a job altogether. In order to do that you have to assemble it at certain points, usually at the material yards. The most practical plan the writer has found, and one which is working out fairly well, is—first, the makers of the requisitions must state on them if they desire any part of the material shipped before it is all complete. All other requisitions will be construed as meaning that nothing is to be shipped until everything else is ready, the reason for this being that invariably when a requisition is made, and before it has time to get the necessary approvals, to say nothing of assembling and shipping the material, the makers commence telephoning to ship this, that and the other thing, and in this way by getting a part of the material on hand they use as a lever to force greater efforts for delivery of the balance by claiming that the men are on the ground, the loss of time, etc. This, of course, is not

right, and is a false position, and it is the first thing that has to be stopped, for there is no excuse for men being sent to a job until the material is there or they have knowledge that it will be there by the time the men are.

So unless a requisition comes in with a notation for some particular item or items that are to be shipped on a given date, it will be held until it is all ready. The storekeeper, on receiving this requisition, will check it up, as described above, lay aside and mark such material as he has on hand to apply upon it, making provision for the balance to be assembled in the same way, and when it is all received and ready for shipment he will notify the maker of the requisition that the material is loaded (giving the numbers of the cars) and will go forward on a certain train. Or, in the absence of any such notice, the shipping notice itself will be notice to the maker of the requisition that the material on his requisition for such and such work is on the way and is complete. It is then for him to have the necessary men there to receive it, take care of it, and go on with the work. Of course, there are many details that enter into this transaction that do not make it easy. For example, it is frequently desirable to furnish the foundation material and the rough lumber. Then we should follow along with the mill work, finishing up with the hardware, plumbing, etc. This should be done in the case of large work. The storekeeper will simply have to keep in touch with the job and keep the material going to

the work as needed, but for all small work the plan can be carried out intact, as above.

In order to do this, however, it is necessary to have a well equipped and arranged material yard, plenty of room for assembling, and if possible such distributing yards should be located close to the industries and shops, so that the shop work can be assembled. This is generally the class of work which causes the most delay and trouble, but supply departments will do well to concentrate their efforts toward organizing along these general lines with this general purpose in view, but they can never do it so long as the idea of direct shipments, low cost and low stock is considered the unit of efficiency.

MARKING AND LOADING.

The greatest care must be exercised in marking and loading material. There is no reason why a railway store should not load and mark its material as well as any first-class manufacturing or jobbing house, and a good organization will do it. In addition to careful packing and marking the address, the requisition number must always be noted, and the date of shipment. The reason for this is to enable the storekeeper and inspectors to tell, when material is found out on the line, the date it was actually shipped there. This has been found by practice to be useful, and leads to much good. This is particularly applicable to frogs and track material where the marking is put on with white lead.

The arranging of freight in cars for trans-

fer to division stores is a very important matter, and by being handled properly can very greatly decrease the cost of doing work. For example, bolts of different sizes should always be separated. If they are loaded in barrels, throw in a few sheets of paper between each size. Pipe fittings the same way, in fact everything should be marked in the car, even though it be a carload for one point, so that the receiver of the material can take it out and put it in his racks or shelves in the least possible time. The material can be arranged in this way in cars just as quickly as it can a wrong way. By furnishing an advice of shipment which will reach the consignee before the material does, the man receiving has a guide to what is in the car, and the material is in order to check and put away.

The full importance of loading, marking and invoicing material from railway stores has never been appreciated, and has in the past caused much criticism, investigation, and needless delay as well as expense. Here is where the organization of the general store comes in. It is the pivot around which all other operations revolve, and without it no thorough or economical store system can be maintained.

Probably more freight is lost by imperfect marking and description than in any other way. Not only should the package be carefully marked with the address and requisition number, but wherever possible the material itself should be marked. For example, the frogs should have the angle and weight of sec-

tion marked on them, as well as the party to whom it is consigned. All other material of the same character should be treated in the same way.

CHAPTER X.

MANUFACTURING, REPAIR WORK AND SHOP DELIVERIES.

INDUSTRIES AND SHOP WORK.

Probably no more important aid to the supply department could be given than to have such manufacturing industries as the planing, rolling mills, and foundries in charge of and under the direction of the general storekeeper, and why should not this be done? He of all officers is most interested, because he is the man who is looked to for furnishing material, and the full effectiveness, economy and usefulness of these industries cannot be obtained unless it is understood they are the manufacturing plants for the railway and not for any particular individual or department. He is in position to know how much to make, and how much not to make. The idea of making up a lot of stuff just because it can be done cheap, and for the purpose of keeping the men at work is a ridiculous and vicious policy, yet it is one that has always been offered as an excuse for making up material that is not wanted, and in many cases it has been considered a satisfactory explanation. The real economy of manufacturing by railways is the fact that they are able to get just what they want when they want it, and not be obliged to keep a lot of stuff they do not need. In no other way can the general storekeeper carry out the policy

of providing material when it is wanted, and assembling it, unless he has absolute control of the industries which are furnishing it. He is the one who should say what work shall have preference.

Of course, in our railway shops where a great deal of our work is done, repairs made, etc., it is done in connection with maintenance of the equipment, and on store orders from the storekeeper. This is all right, but it must be understood that this work must be done with promptness when it is wanted and in the quantities wanted. Shops that take the position that they are only run for repairing engines and cars cannot possibly be of assistance to the supply department in furnishing material. It must be clearly understood that the shops are run for the benefit of the railway.

There is probably no branch of the service that needs a more careful and thorough investigation than the manufacturing in our shops. It should be clearly and distinctly understood that the supply department is responsible for the stock, and that the shops should give it as good service wherever possible as would be received from an outside manufacturer. Where the conditions are practical such facilities should be under the direct supervision of the supply department.

The storekeeper should have such an organization as will permit him to be in perfect touch with the work going on at the shops each day; checking up the orders, delivering the raw material, taking away the finished products, etc.

He will find this will overcome some of the delay and complaints regarding shop made materials and repairs.

Delivery by supply cars has been fully explained in another chapter, but it will do no harm to say that these cars are the connecting link between the storehouse and the users of material, and should be utilized to their fullest extent. These cars are in charge of store men, who actually deliver the material to the work and are in position to know that only what is wanted is delivered, and bring in everything that is on hand that is not wanted or can be spared. These cars, in addition to covering the division on monthly schedule, and distributing supplies for all ordinary maintenance and operation, to agents, trackmen, signal supervisors, plumbers, etc., should utilize the balance of the month in distributing supplies to local storehouses, roundhouses, car repair stations, etc., thus doing away with the cost of handling through the freighthouses, and incidentally delay and loss of shipments. They are transfer stores and, as stated, are of unlimited aid to the economical operation of the division.

Their great value consists in the fact that they are able to actually deliver to the work just what is wanted when it is wanted, and where it is wanted, and pick up and bring in everything that is not wanted without opportunity for loss or delay, and render an accurate accounting for the same at the lowest possible cost for movement or handling.

SHOP DELIVERIES.

The delivery of material to our shops is a matter which requires the most careful organization and supervision. It has been the practice on most railways for the men to call and get their material at the storehouse and supply depots. In order to facilitate this many sub-stores have been established at convenient locations. In the absence of the shop delivery system, which has been described, this is the most practical thing to do. The objection to the sub-stores is that it necessarily means a very considerable duplication of stock, and you are never exactly sure that the thing wanted is in that particular place. Besides, it divides up your forces so that the full benefits of a concentrated organization are not obtainable.

The plan which the writer considers the best from every standpoint is the system of delivery by the supply department to the work. This is carried on in this way: To start with the material in the storehouse is all arranged in sections, that is, material of the same general character being grouped together in charge of a storekeeper, who does nothing but maintain this stock and deliver it. In each of these sections is a telephone which bears the same number as the section. In each shop there are several stations with telephones arranged conveniently, with cards tacked up, which show where the material is located. If a special item is required reference can be made to an indexed book arranged alphabetically, which

shows the section each individual item is located in.

For example, the man engaged on air brake work wants something in his line. He calls up the storekeeper of Section 7, who has charge of this class of material, and tells him what he wants in his own way. Both these men are practical men, they are engaged every day in this work, and they can talk the matter over if necessary between themselves on the telephone. He tells him what he wants and goes away about his work. The section storekeeper takes this down on a shop order, puts up what is wanted, rings the bell for the delivery boy, a number of whom are stationed at the foreman's desk the same as bell boys in a hotel. The boy takes the ticket and the material and delivers it to the man, who receipts for it. He brings the ticket back and delivers it to the storekeeper, who puts the time called on the ticket, time delivered, and puts it in his box. Thus you have the same system established that obtains in any of our large department stores.

The reason for the manual system is that these men may find when they make the delivery that it is not just what is wanted, they find out on the ground just what is wanted, and go back and make the exchange. Then again they are constantly in touch with the men that are doing the work, and can anticipate their needs. In other words, they are the connecting link between the storehouse and the job. This is of inestimable value to the sup-

ply department and to the company, for the reason that it keeps the mechanics at their work all the time, and it necessitates only the carrying of just what is wanted for the particular work at the time. It has been found by experience that each delivery can be made in an average of five minutes.

A full description of this system was presented to the Railway Storekeepers' Association by the writer in 1907, and it is appended hereto for more detail information, but the idea is simply this: Any system that permits high priced mechanics and their helpers to go any distance from their work and hold a post mortem, as it were, regarding materials is wrong, and should not be permitted, and there is absolutely no reason, if a proper organization is maintained, why a man cannot get what he wants delivered to him. There is no way that this can be done except by the man who is actually engaged in the work being in shape to connect personally with the man who has the material. This also cuts out the transferring and handling of these matters through the foreman, and gives him more time to attend to other work, which is of more importance. The expense of actually doing the work cannot be anywhere near as much, because the mechanics and their helpers will go for the material, and, if it is heavy, they will get someone else to bring it down for them.

Finally—the full purpose is to provide what is wanted when it is wanted as economically as possible, and that this can be done by an

organization maintained and trained in this work, whose unit of efficiency is its ability to do this work successfully, more economically and better than any other department whose unit of efficiency is something else, is so apparent that it needs no discussion. The facts are that today, nothwithstanding constant statements to the contrary, the service of our railway stores is probably 100 or more per cent. better than it ever was when departments were maintaining their own stocks, and is being done with at least 100 per cent. less money invested in material. But that it can be greatly improved there is no question, as the full value of prompt and efficient service is not yet fully understood or appreciated. The very criticism which the store system receives from other departments will eventually bring about the most efficient organization that can be devised.

CHAPTER XI.

Accounting.

No attempt will be made to go into the details of the accounting for material and supplies used. This matter is entirely in the hands of the accounting department, and varies with the various railways and policies of the owners and executives. The only matter relating to acounts with which we will deal is that which pertains entirely to the storekeeper's responsibility, and to the extent to which it applies to the economical operation of the department.

There is no question but what all the detail of accounting should be done by the division storekeepers on the ground. No other system is practical, for the reason that these men are the only ones that are in a position to actually transcribe the results of operations from day to day.

The writer is strongly of the opinion that daily accounting is as preferable to monthly accounting as monthly accounting is to yearly. Or, in other words, for the purpose of knowing more accurately just what is going on, a system of daily accounting or estimates should be installed at each of the division stores of the property, whereby the division storekeepers may know every day approximately how much business has been done, and what it has cost to do it. This information should be wired to

the general storekeeper each night, and tabulated by him. This is done more to keep control of the material and the cost of doing the work than for any other one thing. This system is being followed on some of the large railways with excellent results. It does not cost any more to do in this way, and I do not believe as much.

The trouble with our accounting in the past has been that it has been too ancient. Current accounting is the greatest possible aid to the executive, and the only way he can keep control of, and be familiar with his business. It does not do him any good to know what has happened 60 days, or a year before, he wants to know now. In fact the best accounting would be accounting which would tell him what was going to happen instead of what has happened. I think accounting ought to anticipate results as well as record them. So it is apparent that the successful storekeeper must be able to anticipate his transactions. Just how far in detail this can be done profitably is a question which the accounting department will have to decide.

STOCK BOOKS.

The stock book may not come directly under the head of accounting, yet it is really the basis of all supply department accounting and the most important record in it. The stock book is a register of every thing that is on hand at a specific time. First, and of most importance, it is a technical description of the article, and it should be identified by a number. The book

is arranged in columns by months and shows:

Average monthly consumption previous year,
Amount on hand first of each month,
Amount ordered during that month,
Amount on hand succeeding month, etc.

This book is in general use all over the country, and has been for a great many years.

These books should be prepared every year, and written up at the same time. This for the reason that the descriptions must be uniform. and for the further reason that the same item should appear in the same place in the book at each store on the railway.

It may be said that it is not necessary to write up items that are not carried at certain places. This can be answered by the statement that the stock book is really the catalog of the railway, and answers every purpose of a jobber's catalog, except the illustrations. So that the storekeeper that has a stock book is in position to order whatever may be called for at any time. There is no necessity for his carrying an article in stock just because he has it listed. The disadvantages of having these items is the bulk of the book, but this is more than offset by its usefulness.

After the stock books are all written up and delivered to the storekeepers, they must arrange their stocks to agree with the stock book, mark it exactly the same, and have it run in order. This for the reason that everything should be concentrated to save time and for convenience in taking stock, which has to be done every month. The average monthly

consumption is deduced from the previous year's business, and serves as a guide for future orders. It must not be used arbitrarily, but is an indication and a very valuable one.

A monthly inventory must be made, but it should be borne in mind that this stock-taking is for the purpose of ascertaining the sufficiency of the stock on hand, and is not intended to cover the value. It is usually carried on by two men, the section storekeeper and his helper, but if he has no helper the two section storekeepers join for stock-taking purposes. One man calls off the number of pieces on hand, the other man enters the amount with a hard pencil in the on-hand column. This stock can be taken just as rapidly as one man can make figures in his book. At the same time that he checks the amount on hand he should enter in the order column the additional amount he thinks he will require. This for the reason that the stock appears differently when actually seen than it does as an entry in a book. You might have fifty of an article shown in a stock book, and it might look like a great many, but if you were looking at the material itself, and knew by practical experience how many were being used, you would get an entirely different impression. Hence, it is important to put down at the time, in pencil, how many additional should be ordered, although it may be changed afterwards.

After this is done there should be brought forward and placed directly over the amount on hand the amount due; e.g., $\frac{44}{24}$ meaning that

there are 44 on hand and 24 due on previous requisitions. The section storekeeper should look over carefully what he has ordered, taking into consideration the back-orders which he holds, the detailed information which he has regarding the conditions of the work going on, time of year, kind of deliveries he is receiving, and according to his best judgment enter in the amount that he thinks he ought to have of each item in his section. The book should then go to the storekeeper, who, in company with his store foreman, should go over the items thus ordered, making any changes which his further knowledge of conditions may warrant, and the requisition is then prepared accordingly.

It will be seen by this that an actual inventory of stock is taken every 30 days, consequently it is being constantly checked for errors and revised, with result that practically a current inventory is maintained. Constant inventories are the most important factor connected with the control of stock.

RECEIVING RECORDS.

This is the second most important record, and is a diary of the entire transaction, from the time a requisition is made until it is completed, and the invoice or purchase bill passed for payment. It must start first with either a transcription of the requisition or a carbon copy of it. It has been found economical and desirable to make two forms of the requisition or receiving record and prepare them at one

writing on a typewriter with a carbon. In addition this form will have columns to show—

Date received,
How received,
Amount received and the seller,
Point of delivery,
Routing,
Number,
Date,
Amount of invoice or purchase bill,
Amount of freight charges, if any,

and a column of remarks in which is entered the condition of the shipment, and a memorandum of the date the item was hurried. This book is of great value for tracing purposes.

The first information to be entered is the number of the order placed by the purchasing agent, the name of the seller, point of shipment, routing, etc. The purpose of checking this order against the requisition record first is to check the description with the description on the requisition, to note and correct errors in placing the order, if any are made. Besides it gives additional information of when and with whom the requisition was placed for tracing. The next information entered is the advice of shipment, either in the form of a shipping notice, bill of lading, or purchase bill. Herein is noted the date of shipment, what was shipped, from whom, checked against point of delivery and specifications.

The next entry is taken from the hip pocket "freight received book," which is the original receiving record, kept by the section store-

keeper, in which is entered daily the material received in their respective sections. This entry (as explained in another chapter) gives reference to the date, car number and initial, waybill reference, how packed (boxes, bundles, crates, etc.), and the detailed checking of what they contain entered by the section storekeeper, who unpacks the material and puts it away. The contents of these books are transferred to the requisition or "freight received record," against each respective requisition, showing quantities received, date received, and how received. Thus it will be noted every particular item is identified. The next information is the purchase bill, which is checked against the receipt of material as regards quantities, descriptions, test reports, point of shipment, routing, and the amount and number of the purchase bill or invoice, and the freight charges. The proper certification is then made on the face of the original as to the receipt of the material, giving reference to the page in the receiving record, where it is to be found; thus having a complete history of the transaction from the time it originated until it closed, a most valuable permanent record thus can be obtained.

This book, in addition to being an accurate record of every requisition made and all material received, also serves the purpose of identifying each particular shipment, and each specific item. The book also shows everything that is outstanding, that is, obligations in the way of unfilled requisitions; is used entirely

for tracing, and becomes without question the most valuable and useful record in a railway store. Its primary purpose is to make an absolutely complete record of everything ordered and everything received.

ISSUES.

The issues are all authorized, either by approved requisitions or shop orders, and covered, either by departmental invoices or direct charges to operating accounts. Department invoices are drawn to cover all materials issued on approved requisitions, and are simply a bill against the department making the requisition. These are usually prepared monthly from the daily manifests, which are made directly from the original requisitions, and sent to the head of the department, where they are checked against the receipted manifests, and if found correct approved for entry in that month's accounts. Shop charges, that is, material issued directly to the shops for work being done there, is usually charged direct to the operating accounts from the shop tickets, and the tickets either retained on file or submitted with the detail charges to the shop superintendent or master mechanic monthly. Transfers between stores are handled the same way as transfers to other departments, i.e., by departmental invoices. The storekeeper depends fully on the requisition for his authority for the issue of material, and any material issued without a requisition or an order is unaccounted for. Many other schemes of attempting to

balance up special items, etc., have been put into effect and carried on to a certain extent, but they are impractical, and the only way to see that credit is received for everything that is issued is to have sufficient help to see that nothing is taken without a requisition.

CLASSIFICATION.

The classification of material is for the purpose of keeping track by classes of how much is used of each class, and is for the primary purpose of enabling the officers to have an intelligent idea of what the amount of material, in dollars and cents, of various classes is on hand as soon after the close of the month as possible. This record is of primary importance to the storekeeper and general storekeeper, and for the purpose of controling stock is probably of the greatest value.

In order, however, to obtain full benefit from this statement it must be intelligently classified, that is to say, it must be divided into sufficient classes so as to indicate clearly what it is intended to show, not generalize. At the same time, no more classes should be permitted than is absolutely necessary. With the exception of the one column, Class 24, miscellaneous, shown herewith, I consider it an entirely practical classification, and the best one the writer has seen. A miscellaneous class should be eliminated from any classification. After all, the real value of a classification is not so much the name and number of the class as it is to maintain the same thing all the time. All fig-

ures of a statistical nature are of little value except for comparative purposes.

The classification is arrived at briefly by abstracting, from the purchase bills, department invoices, and other charges to stock which constitute receipts or debits. The manifests, invoices against other departments, bills collectible and shop tickets are abstracted in the same way, and represent issues or credits. The results thus obtained are shown on a statement entitled Classified Statement of Material Received, Issued, and on Hand, and shows the amount on hand the previous month, received during the month, total to account for, amount charged out, transfers to other departments, transfers to other stores, sales, the difference being the balance on hand to carry forward to the succeeding month.

A statement of this kind is made up by each division store and from it is compiled the Classified Statement of Stock on Hand, which is the ultimate purpose of this statement, so far as the storekeeper is concerned, and forms the most concise and clear analysis of the condition of the stock of any statement produced. It can, of course, be sub-divided as finely as may be desired, but it is believed from 75 to 90 classes will segregate any stock as much as necessary.

The Classified Statement of Material Received, Issued and on Hand also serves the purpose of a balance sheet, in fact this is its primary use. The original goes to the auditor for this purpose, and is corrected by him; but the

nth of.....19....

Issued During the Month.						On Hand at Close of Month		Class No.
ts. Trans. to Other Stores		Sales		Total				
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
								1
								2
								3
								4
								5
								6
								7
								8
								8½
								9
								10
								11
								12
								13
								14
								15
								16
								17
								17½
								18
								19
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general storekeeper makes use of this same form for the purpose of obtaining as quickly as possible, after the close of the month, the actual condition of the stock.

PAY ROLLS.

The pay roll is always a matter of grave importance, and one that must be watched closely during the month. The writer has found the system of daily accounting (carrying the disbursements down daily) to be of great assistance in controlling the cost of operation, in cost per thousand dollars, or percentage of cost based on disbursements. While this is not by any means a fair criterion or representation of what is being done, still it forms the best unit of measure that the writer knows of. It is based on disbursements, it might be based on receipts; in fact it probably should be based on both, and generally is, but the purpose is to show how much it costs to handle every thousand dollars' worth of material in and out. Values enter largely into this, as well as the manner in which the work is done, but it is assumed, and known by all practical men, that statistics of this character have little value except to the general storekeeper himself in comparing his own results with previous results, and one division with another, with full knowledge of the conditions which govern. Comparisons with other roads and other methods, doing their business on a different basis in a different way, are of little or no value, and do not represent anything in particular;

but where an officer maintains the same system of comparisons, year in and year out, in a short time he has a valuable guide, which is the most that can be said of a statement of this character.

The above may be said to embrace practically all the essential accounting, so far as the supply department is concerned. There are innumerable statistics and other valuable data prepared, connected with the buying, distribution and accounting for supplies, but my purpose has been simply to call attention to the vital factors which are absolutely necessary, and of direct and positive assistance to the supply department in maintaining what is wanted, accounting for it and controling it.

CHAPTER XII.

Buying Under Contracts or Agreements.

The plan of purchasing under contracts or agreements directly from manufacturers for the purpose of maintaining standards and obtaining uniform material and uniform deliveries is one which was developed by W. V. S. Thorne, director of purchases for the Harriman Lines, and is most ably and thoroughly outlined in detail in a paper read by him before the New York Railroad Club, May, 1908. This paper should be studied carefully by every executive officer, as well as officers of the supply department. Its principles are based on the necessity of establishing and maintaining standards, and buying what is most suitable for the purpose desired at the lowest cost, fully protected by complete specifications and thorough inspection.

The first is brought about by regular meetings of experts who use the material, and who should know the exact purpose which it serves and what is best adapted for that purpose. For example, in the matter of equipment, locomotives, cars, etc., the expert representatives of this department meet at stated periods. If it be on maintenance of way matters, the chief engineers or engineers of maintenance of way are called together in the same manner.

Certain specific equipments will be sub-

mitted at this meeting, freely discussed, and finally a vote taken as to adoption for use of some one of them. Detailed specifications and drawings will then be prepared of the article adopted, and it will bear the same number as the drawing, and is designated common standard. Any future changes in designs and specifications will be covered by supplement or revised drawings and will always carry the same number.

In this way the drawings and specifications are placed in the hands of the different manufacturers, and the most satisfactory as regards price, deliveries, etc., is accepted, and an agreement made for the necessary supply. The manufacturer is thus able to figure accurately just what it will cost to produce this particular article; his market is assured and he can arrange his facilities and plant so as to produce it at the lowest possible cost. The railway company on the other hand is assured of getting exactly what it buys, and it can be arranged so that they will get uniform and specific deliveries.

These contracts and agreements are usually based on the market price of raw material, and are subject to change within a reasonable length of time, which is indicated in the agreement, so it is perfectly fair for both parties. This agreement, in addition to specifying the price at which the article shall be delivered at a given point, should also specify the number of days that they agree to make shipment from the date of the order, with a penalty clause for

failure to do so. Under this arrangement the purchasing agent is in position to place the order the day he receives it, the descriptions, drawing references, price and deliveries already having been arranged for. The manufacturer has the drawings, schedules and full detailed knowledge of what is required, and the day the order is received he is in position to either make shipment or prepare the material for this purpose.

The material is inspected on the ground by this company's inspector to see that it conforms to the specifications and drawings, a certified copy of such acceptance is attached to the purchase bill covering the shipment, which goes directly to the purchasing agent, who is thus in position to check the prices and deliveries according to the terms of the agreement.

No more fair, simple and thorough system could be evolved, and it carries with it uniformity, promptness and the lowest possible cost to the railway company.

CHAPTER XIII.

How to Install the Plan without Disorganization.

This plan can be installed under any system without inconvenience or expense. First, make a rough sketch of your facilities, your storehouse, platforms, material yards and other storage, and lay it off into sections. Have in mind grouping it for economical handling, irrespective of where the material is located at the present time. Indicate on this sketch the section number, general description of the material it will contain and the location of the section storekeepers' headquarters. Have signs put up over these sections with the section number. Build a small station for the section storekeeper, large enough to contain his stock books, requisitions, catalogues and other data. Prepare a card which will show the sectional arrangement of the material, somewhat like the accompanying list. Tack this up at section headquarters, inside and out. Prepare an indexed list of the material to be carried in each section, arranged alphabetically, which will show the section where it is located. Distribute these lists and cards to each division and local storekeeper, the superintendent, division engineer and all other officers who have authority to make requisitions for material and instruct them to make their requisitions from a certain date by sections, a separate requisition for each section.

SECTIONAL ARRANGEMENT OF MATERIAL IN STOREHOUSES.

Section. *Description of Material.*

1. Maintenance of way material, steam shovel parts, hand car, motor car and velocipede parts.
2. Bolts, nuts, rivets, lag screws, washers, etc.
3. Sheet iron, brass, copper, zinc, lead, engine bars, springs, tubing, chain, wire rope, jack screws.
4. Boiler and firebox steel, steel tank ends, flues, pipe, bar iron, bar steel, piston rods.
5. Boiler lagging, pipe covering, nails, carbide, shovels, rops, building paper, wire staples, handles, etc.
6. Finished and rough brass, pig metals, etc. (except journal bearings).
7. Air brakes, lubricators, injectors, automatic sanders, steam heat equipment, Pintsch and acetylene gas material, electric headlight parts.
8. Car trimmings and fixtures, shelf and building hardware, small tools, metal piston and valve stem packing.
9. Water service material, pipe fittings, globe, angle and gate valves, etc.
10. Upholstering material, etc.
11. Glass, brushes, painters' supplies, paints in packages.
12. Belting, hose, packing, rubber and leather goods.
13. Station and train supplies, lamps, lanterns, chairs, glassware, tinware, etc.
14. Castings (rough iron and steel), except car castings.
15. Car castings and forgings, journal bearings, bolsters, brake beams, car trucks, car bolts, couplers and parts, train chains, stoves and parts.
16. Wheels and axles (mounted and unmounted), tires, centers, front ends, cylinders, etc.
17. Lumber, all kinds (rough and finished).
18. Fire clay, brick, cement, coke, charcoal, smithing and Blossburg coal.
19. Oils, waste, grease, varnishes, candles, etc.
20. Signal, telegraph, telephone, interlocking and electrical material.
21. Scrap, all kinds.

Then go through your organization and select from your warehousemen and stock clerks, a man for each section. You always have men in every organization who are particularly familiar with certain classes of material. For example, one man will be

familiar with track material, he should be assigned to this section, another with locomotive castings, another with car castings and forgings, another with hardware, etc., and still another who looks after air brake material, lubricators, injectors, etc., aiming always to have a man assigned to the section with which he is most familiar. His instructions will be to take entire charge of this section of material, *no matter where it is located.* He will then naturally concentrate his material into his section and arrange it so it will be most convenient for him to handle it. Only in this way can he control it, and be entirely responsible for it. This can be done gradually as the plan develops and will in no way interfere with the regular operations. It will be found that the men themselves will be more anxious than anyone else to get the material they are in charge of and responsible for directly under their own supervision.

Naturally the requisitions will be made from the stock books, in sections, and the orders on the purchasing agent and the purchase bills will follow in sequence. In fact the whole plan will develop out of this arrangement. The purpose of signs is to identify the grouping of the material with certain numbers. It will only be a short time when if you ask where a certain man is, they will answer by giving the section number. The next step will be to install the telephone system, a telephone in each section. This enables the officers and foremen to get in instant communication with

each section storekeeper, and from this the shop delivery system will develop, as described in another chapter.

The same arrangement will apply to scrap docks, lumber yards, oil houses and other outside points where supplies are handled. After the plan is installed the general store the division stores will follow as a matter of course. With the sectional organization once installed, details can be worked out to as fine a point as desired and to suit any general plan, and it can be done without disorganization or extra expense.

CHAPTER XIV.

Weakness and Strength.

The weaknesses of the present supply department are: first, the officer who is usually held responsible for providing material and the money invested in it really has no control over the buying of it. Strange as it may seem, the general plan is to have him subordinate to the purchasing agent. On what theory this is based the writer is unable to conceive. It is certain that the man who is responsible for the money invested in material must also be responsible for the buying. In no other way can the desired results be obtained, and it is surprising to the writer that, with the great advances that have been made in the last few years in railway economics, this point has been lost sight of, and that the real purpose of the organization, i.e., furnishing only what is wanted when it is wanted with the lowest permanent investment, can never be obtained until the buyer is under the direction of the officer who is responsible for the investment. On properties where the amount of material used does not warrant an organization of this kind there should be a supply agent who would be responsible for both the buying and distribution. On larger systems, however, unquestionably the proper organization is an officer in charge of both purchases and distribution, with a sub-head to do the buying and another

to maintain the stock and have charge of the distribution.

The second trouble is lack of proper organization and system; and a man with the necessary rank and detailed knowledge and training to effect it and carry it on. One of the first and most important facts to take into consideration is the danger of more material being provided than is necessary, and lack of proper interest in seeing to it that everything is made available. This should be one of the first and most important duties of the chief supply officer, and it is necessary that he should have such rank as will enable him to get the full benefits of his organization. Without a proper organization, manned by competent help, nothing of any great value can be maintained. The strength of an organization depends very largely upon its head and its personnel, and the men in it must have the same rank, opportunities and remuneration as those in other departments. It is not technical knowledge that is needed, but good business training and industry. Our organizations have been severely handicapped, and will be for some years, for lack of trained help. It has been recruited largely from men transferred from other work, principally in and around the shops. Younger men coming up, as soon as they could get something better to do, got transferred, with the result that there is today a smaller percentage of trained men capable of handling supplies than in any other department on a railway. But they are in-

creasing rapidly, and it is only a matter of a few years when there will be plenty of trained men to take up the work. There has never been any systematic method of apprenticeship and promotion. There is no question but that this can be done, and will furnish great strength to the organization.

Another weak point in most organizations is the failure to grasp the importance of prompt action and its relation to stock and stock investment. Their efforts have been devoted more to obstructing than taking action. Their idea was that by delay and obstruction some other arrangement would be made, and the material would not be needed at all. For that reason departments that had work to do did not have confidence in getting what they wanted, and consequently laid in large stocks and made provision, simply because they knew by experience they never could get anything when they wanted it. This led to enormous losses in the way of material deteriorating and becoming obsolete.

The first essential towards a competent organization is the prompt handling of requisitions. Until stocks are in such shape that requirements may be filled, and the organization is in such shape as to promptly do so, they are impotent, and serve no good purpose. Lack of facilities hampers operations very considerably, but with a proper organization this can be largely overcome. The advantage of facilities is chiefly for proper protection of

material from the weather and to reduce the cost of handling.

The accounting in our stores has generally been well presented, in fact it has received first consideration. In many organizations more money has been expended in keeping the accounts than in caring for, handling and distributing the material. Yet in many cases the accounts are worthless, because they are on an unsound foundation. Inventories have been taken in offices without any knowledge of the material, what it was, or the condition it was in. While reports and records neatly kept may look well written up on a typewriter, they may be found to be absolutely worthless, and unless they are based on actual inventories and have been compiled by practical men on the ground, they are not worth the paper they are written on.

The delivery of material is another source of weakness. It is the usual practice to send it in local freight, and we all know what it is to move company material in this way. The supply cars solve the problem so far as ordinary maintenance and operation are concerned. That is, where each division has a set of cars it covers a great many local deliveries, but still we have a great volume of material that will always move on local freights in the regular way, and this will always have to be watched and delays carefully guarded against.

The strength of the organization consists:

First—In the fact that there is a strong, growing demand for it, made necessary by con-

centration and system, the enormous amount of actual money that is required to furnish materials for large railways or industrial corporations, and the fact that executives recognize that this work can only be properly and economically done by men whose every-day work it is; and as they commence to realize what an organization of this kind can do towards reducing expenditures for material and supplies, maintaining standards, facilitating the work, as well as protecting the company against extravagance and loss, the importance of the department will be greatly enhanced. Our owners and executives are bound to appreciate sooner or later that a supply department should be for the purpose of decreasing, not increasing, its purchases.

Second—It is being equipped with strong young men who are ambitious and workers; men who have learned the value of close application to detail, and who have become accustomed to devoting their entire efforts to the work at hand. These men will develop and always carry with them a complete and well founded knowledge of details and facts as they exist in practice.

Third—The training they have received in the past, and the reorganization that is going on at present, is all along the line of greater economy and efficiency. This will lead not only to better results for their employers, but it offers employees a training and molds their character in a manner which will last through their entire lives.

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